Dairy Cost Study

The Economics of Milk Production in Alberta 2003

Economics & Competitiveness

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THE DAIRY COST STUDY:

ECONOMICS OF MILK PRODUCTION

IN ALBERTA

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by

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Foreword

This report was prepared from the farm records of 64 milk producers in Alberta who volunteered for the 2003 Dairy Cost Study. Their participation was encouraged by Alberta Milk which provided financial compensation to participants. The Economics Unit, as well as fellow producers, are most appreciative of the time and effort they gave in providing timely and accurate information.

Questions or comments regarding this study, formula pricing, or other related issues should be directed to:

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Introduction

The fluid milk price received by dairy producers in Alberta is regulated by the Alberta Energy and Utilities Board (AEUB). The Economics Unit conducts an annual study of dairy production costs and returns in Alberta to assist the AEUB in administering fluid milk prices. Introduced during World War II, this annual "Dairy Cost Study" is recognized by dairy farmers, consumers and the AEUB as a reliable reference for setting fluid milk prices.

In addition to the Dairy Cost Study, the Economics Unit is also responsible for the fluid milk price indexing formula, a computer model that provides an estimate of changes in monthly producer costs (Appendix F). This model enables the AEUB to make more frequent adjustments to the producer price in response to changes in production costs during the year. At the end of each year, the performance of formula pricing is evaluated and compared to the Dairy Cost Study. If warranted, further adjustments to the producer price can then be made.

Specifically the objectives of the study are as follows:

- to provide a continuing account of the costs and returns of fluid milk production in Alberta;
- to annually monitor the performance of the fluid milk pricing formula;
- to use the findings as a basis for revising the formula price;
- to provide the participating dairy farmers with a personal business analysis for management purposes; and
- to provide economic information for farm management and extension education.

This costs and returns account is a vital economic indicator for pricing fluid milk in Alberta because the industry is under a system of supply management.

The Dairy Cost Study

The Dairy Cost Study is an analysis of the costs and returns of a sample of Alberta dairy producers for a given production year. Study participants are required to complete a monthly questionnaire of their dairy production activities - dairy herd inventory, capital purchases, milk sales and farm use, feed use and purchase costs, labour costs, and other expenses related to the dairy enterprise - and an annual questionnaire of their dairy investment. (The questionnaires are shown in Appendix E.) From this database, weighted sample averages are calculated which represent benchmarks for all dairy producers in the province. As well, study participants receive a confidential report on their dairy operation which can be compared with these provincial benchmarks.

As the analysis is based on monthly survey data collected from milk producers, the results indicate the cost of producing both fluid and industrial milk. However, the cost of producing only industrial milk should not be significantly different. In 2003, approximately 51 percent of Alberta's total milk production went into fluid milk, with the remainder going to industrial uses. Moreover, since 1988 the quality of fluid and industrial milk in Alberta has become almost indistinguishable.

The Survey Group

Sixty-four dairy producers across the province submitted monthly business information for the 2003 calendar year. Two regional sub-groups were also identified for Northern Alberta (north of Ponoka) and Southern Alberta. Both Northern Alberta and Southern Alberta were represented by 32 producers participating in the study.

The study was designed to represent a cross section of dairy farms by the size of their milk quota. Efforts were made to select study participants by systematic random sampling to provide better representation of the total population. Some characteristics of the sample are shown in Table 1. Appendix D presents charts showing individual results for the 64 dairy study participants.

Table 1

2003 Sample Characteristics

Years in Dairy	Total Sample	Indebtedness		Herd Size (# of cows)	
	%	<30%	≥30%	<50	≥50
<10	22	1	13	1	13
≥10	78	23	27	12	38
Total (%)	**100**	**37.5**	**62.5**	**20**	**80**

Study Methodology

1. **Enterprise identification:** There are several different approaches for calculating the farm cost of producing fluid milk. Some studies use the total farm approach, which combines the dairy costs with those of other enterprises. This Alberta study examines only the dairy enterprise, which is defined as all activities associated with both milking cows and maintaining dry cows and young dairy stock. In most cases, the dairy operator uses home-grown feed, either entirely or in association with purchased feed. The costs of production of the homegrown feed are allocated to the crop enterprise portion of the farm, and are not considered in the dairy enterprise. Consequently, the final costs outlined in this report are only those associated with milk production.

2. **Inventory adjustment:** Since the cost of raising young dairy stock is included in the cost of milk production, the total income includes net cattle sales and net inventory changes. Cattle inventory changes, or herd growth, are determined by subtracting the beginning-year inventory value from the year-end inventory value. Gross income is thus composed of milk sales, net cattle sales, and the value of this net inventory adjustment. The net inventory adjustment may be negative or positive.

3. **Home grown feed:** Hay that is grown on the farm and fed to dairy livestock is priced at the regional market value of stacked hay on the farm. Similarly, feed grain is valued at regional elevator prices provided by the Alberta Grain Commission. In other words, the dairy enterprise is charged the current market value for these home-grown inputs, just as if they were purchased from the cropping enterprise. The total value of home-grown feed is determined by multiplying the regional value or price by the actual quantity fed. This procedure adequately compensates for the production cost of home-grown feed. Alternatively, where feed is purchased, the actual purchase cost is used in the analysis.

4. **Value of investment and depreciation:** The information presented in this report is intended to reflect the average yearly production conditions in the dairy industry. Depreciation estimates are based on the original value of buildings and machinery. Current market value of owned assets is also estimated by updating the original value of the dairy investment with appropriate inflation factors, and then depreciating each item accordingly, based on the number of years in use. Original values and years in use are obtained from participants' farm records. With the exception of acreage for pasture, house, dairy buildings and corral location, farmland is not considered to be a dairy investment. The dairy livestock inventory is valued using the average annual market price. Value of investment is used for calculating the return to equity, and for determining the equity position of the dairy operation.

5. **Operator and family labour:** The operator's actual labour may vary from almost nil on some dairy farms to the total input of labour on other farms. The procedure used in this study to put a value to operator labour is to multiply the operator's labour hours times the average hourly wage rate paid for full time dairy labour (including room and board). This method is preferred over leaving unpaid labour as a residual because of the great variability in labour time between operators. Family labour is evaluated similar to the above, but a lower wage rate is applied to family members under the age of 16. Partners, spouses and other family members (16 years of age or older) receive the same wage rate as the operator.

6. **Interest on capital:** The actual interest paid on existing liabilities is included in the capital cost. To obtain this value, participating producers were asked to report their outstanding liabilities and the interest rates charged. This method is more accurate than reporting the total annual interest paid. When both the total variable cost and the capital cost for the dairy enterprise are subtracted from gross income, the bottom line residual is the return to equity and management. When this residual is expressed as a percentage of the equity capital, then the percent return to equity can be compared with the returns from alternative investment opportunities such as Canada Savings Bonds or term deposits.

7. **Rent:** Rent charges are included in the cost of capital. The capital cost in this context represents the cost of ownership of resources. If resources are rented, there is a charge for their use. If, on the other hand, resources are owned, the owner must bear the cost of depreciation and interest on debt.

Dairy Enterprise Economic Overview

Tables 2 through 4 provide a summary of the costs and returns for dairy producers in Alberta. (Definitions of terms listed in the tables are provided on page nine. More detailed results are presented in Appendices A, B, and C.) In Table 2, the average results for the entire survey sample are listed in the centre column. As well, costs and returns are provided for two sub-groups of dairy producers based on their total production costs, namely the bottom 1/3 and the top 1/3. The bottom 1/3 are the highest cost producers and the top 1/3 the lowest cost producers. The top 1/3 group's total costs were 31% lower than the bottom 1/3, but its revenues were also lower by 4%.

Table 3 compares the average costs and returns for 2002 and 2003. In 2003, total costs were similar to 2002. However, the price of milk sales increased 8.0% from $60.30 per hl/sold in 2002 to $65.12 per hl/sold in 2003, resulting in an increase in return to equity.

Finally, Table 4 compares average costs and returns for Northern and Southern Alberta.

Table 2

Dairy Enterprise Costs and Returns - $ Per hL Sold

Bottom 1/3 (Highest Cost Producers), Average Cost, Top 1/3 (Lowest Cost Producers)

	Bottom 1/3	Average	Top 1/3
Milk Sales	65.70	65.12	64.12
Gross Income	**68.15**	**66.10**	**65.42**
Feed Cost	24.60	21.55	19.71
Main Feed Components:			
Grain	2.45	2.66	2.75
Complete Feed	8.87	7.13	6.03
Roughage	10.96	8.34	7.98
Labour Costs	14.35	9.41	8.24
Other Variable Costs	18.14	14.82	12.69
Depeciation	7.37	6.50	5.18
Other Capital Costs	5.89	3.98	2.97
Total Production Costs	**70.36**	**56.27**	**48.79**
Total Cash Costs	51.15	43.59	38.36
Gross Margin	**16.99**	**22.51**	**27.06**
Contribution Margin	**11.05**	**20.31**	**24.78**
Return to Investment	**1.44**	**12.55**	**18.53**
Return to Equity & Management	**-2.22**	**9.83**	**16.63**
Return to Investment (%)	**1.7**	**10.3**	**18.7**
Return to Equity & Management (%)	**-1.6**	**13.0**	**29.4**

Figure 1 - 2003 Dairy Production Costs
$ per hL

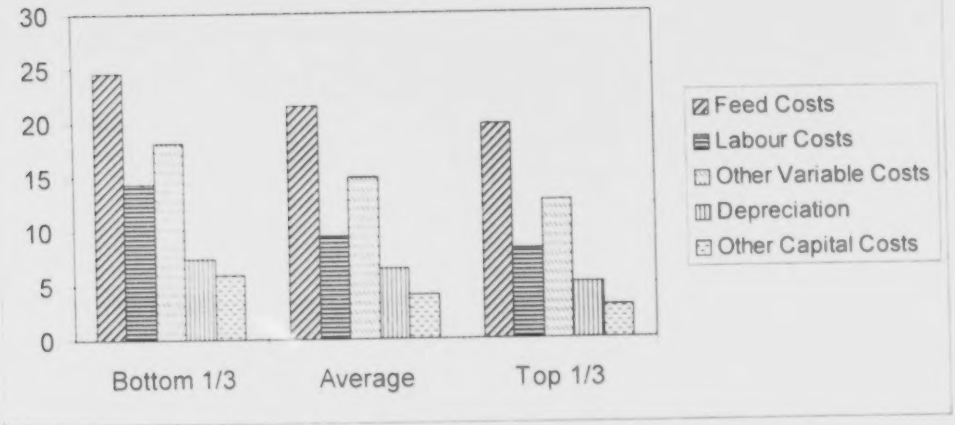


Table 3

Dairy Enterprise Costs and Returns - $ Per hL Sold

2002 and 2003

	2002 (59 producers)	2003 (64 producers)
Milk Sales	60.30	65.12
Gross Income	**63.16**	**66.10**
Feed Costs	21.75	21.55
Main Feed Components:		
Grain	2.98	2.66
Complete Feed	7.71	7.13
Roughage	8.84	8.34
Labour Costs	9.54	9.41
Other Variable Costs	14.35	14.82
Depreciation	6.22	6.50
Other Capital Costs	4.19	3.98
Total Production Costs	**56.04**	**56.27**
Total Cash Costs	43.40	43.59
Gross Margin	**19.76**	**22.51**
Contribution Margin	**17.52**	**20.31**
Return to Investment	**9.90**	**12.55**
Return to Equity & Management	**7.12**	**9.83**
Return to Investment (%)	**8.2**	**10.3**
Return to Equity & Management (%)	**9.3**	**13.0**

Figure 2 - Dairy Production Costs - 2002 and 2003
$ per hL

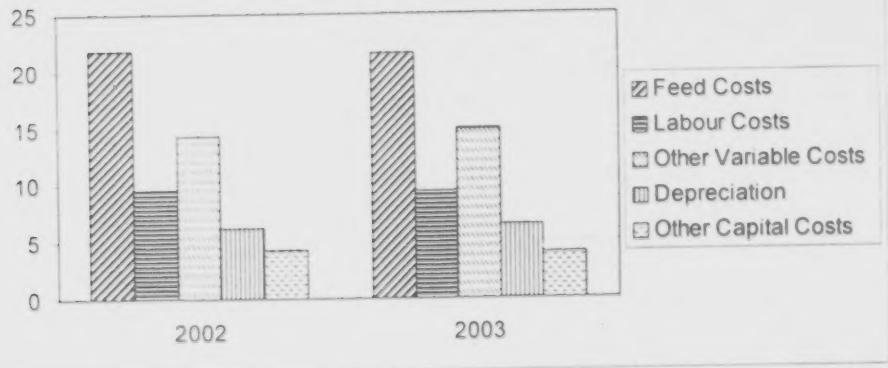


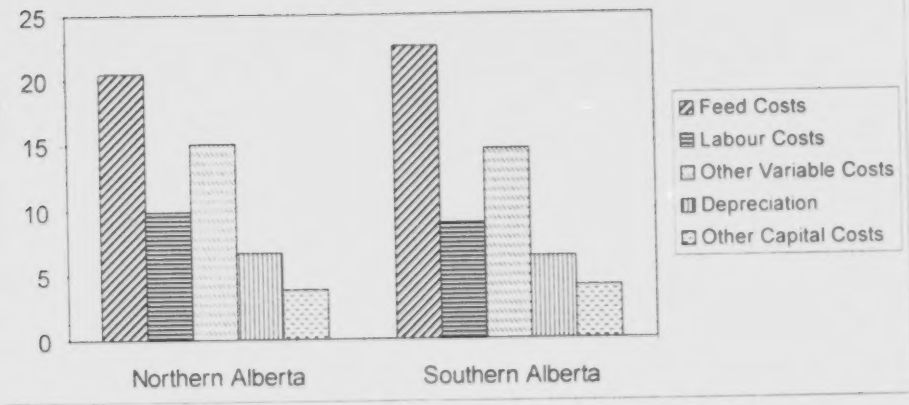
Table 4

Average Dairy Enterprise Costs and Returns - $ Per hL Sold

Northern and Southern Alberta

	Northern Alberta (32 Producers)	Southern Alberta (32 Producers)
Milk Sales	65.78	64.51
Gross Income	**66.64**	**65.59**
Feed Costs	20.53	22.49
Main Feed Components:		
Grain	3.75	1.66
Complete Feed	5.85	8.32
Roughage	8.39	8.30
Labour Cost	9.88	8.98
Other Variable Costs	15.03	14.63
Depreciation	6.71	6.31
Other Capital Costs	3.83	4.12
Total Production Costs	**55.99**	**56.53**
Total Cash Costs	42.58	44.51
Gross Margin	**24.06**	**21.07**
Contribution Margin	**21.20**	**19.49**
Return to Investment	**13.30**	**11.85**
Return to Equity & Management	**10.66**	**9.06**
Return to Investment (%)	**10.9**	**9.8**
Return to Equity & Management (%)	**13.5**	**12.5**

Figure 3 - Regional Dairy Production Costs
$ per hL



Definitions for the Dairy Cost Study

Net Cattle Sales - revenues associated with the sale of dairy livestock (milking / dry cows, replacement heifers, bulls and young stock)

Gross Income - the value of what was produced by the dairy enterprise over the course of the production year. Includes cash and non-cash values of:

- milk sales,
- revenues from miscellaneous sources (eg. milk subsidies, pool adjustments),
- inventory adjustments relating changes in the number & value of stock included in the enterprise,
- net cattle sales

Feed Costs - the cost of all feeds used by the dairy enterprise, purchased or homegrown, based on the market value of these feeds (**not** the cost of raising the feeds).

Labour Costs - a sum of paid and contributed labour, as allocated to the dairy enterprise. Paid labour is valued at cost, while unpaid labour is valued at a standard or base cost.

Other Variable Costs - total variable costs (such as bedding and supplies, vet and medicine, utilities, fuel, repairs) less feed and labour costs.

Depreciation - sum of depreciation and machinery/equipment/building lease payments on assets allocated to the dairy enterprise.

Other Capital Costs - total cash overheads, as allocated to the dairy enterprise (property taxes, insurances, licences and term loan interest).

Total Cash Costs - total production costs less depreciation and family labour.

Total Production Costs - sum of all variable and capital production costs.

Contracted Export Milk (CEM) - the cost is the sum of total feed costs and total other variable costs less milk hauling cost, producers' fees, and taxes and insurance. (This program ended Dec. 31, 2002 with a transition period ending April 30, 2003)

Contribution Margin - gross income less variable costs

Gross Margin - gross income less total cash costs

Return to Investment ($) - gross income less total production costs plus term (capital) interest paid

Return to Equity & Management ($) - gross income less total production costs

Investment - sum of assets allocated to the enterprise. Includes: dairy livestock, machinery, equipment, buildings/facilities and building site.

Median - the value of the middle item of a data set that has been arranged in an increasing order (lowest to highest).

Production Factor Analysis

This section provides a detailed analysis of the survey group based on six specific production factors:

- herd size
- milk production
- gross income
- total cost
- investment
- return to equity

For each analysis, the survey group is sorted into three separate classes (bottom 1/3, middle 1/3, top 1/3) based on the production factor being evaluated. For instance, on the next page the survey group has been divided into three sub-groups based on herd size. The bottom 1/3 group consists of the smallest dairy enterprises while the top 1/3 group consists of the largest producers. Production and management results are shown for each sub-group in the accompanying table and figures.

Dairy Characteristics by Herd Size Class

Herd Sizes ranged from 33 to 492 milking cows. For this analysis, the sample group was split into the following three size classes:

Bottom 1/3	33 - 60
Middle 1/3	61 - 98
Top 1/3	105 - 492

Table 5 - Dairy Enterprise Characteristics by Herd Size Class

	Bottom 1/3 33 - 60	Middle 1/3 61 - 98	Top 1/3 105 - 492
Years in Dairy	19.90	16.95	21.21
Milk Production (litres/yr)	**9,164.74**	**9,485.60**	**9,318.12**
Home Grown Feed (%)	69.15	73.92	71.38
Butterfat Test (%)	3.64	3.62	3.54
Gross Income ($/hL)	66.67	66.42	66.18
Total Costs ($/hL)	**63.36**	**60.32**	**53.09**
Feed Costs ($/hL)	21.43	21.85	21.37
Labour (hrs/cow)	77.69	65.25	50.94
Investment ($/cow)	11,755.25	11,403.14	10,354.67
Return to Equity (%)	4.59	10.79	21.89
Return to Investment (%)	3.82	5.93	12.80
Debt/Capital Ratio	0.26	0.47	0.34

Figures 4 and 5 illustrate Milk Production and Total Costs results for the bottom, middle and top 1/3 groups (sorted by Herd Size Class).

Figure 4 - Milk Production (2003)

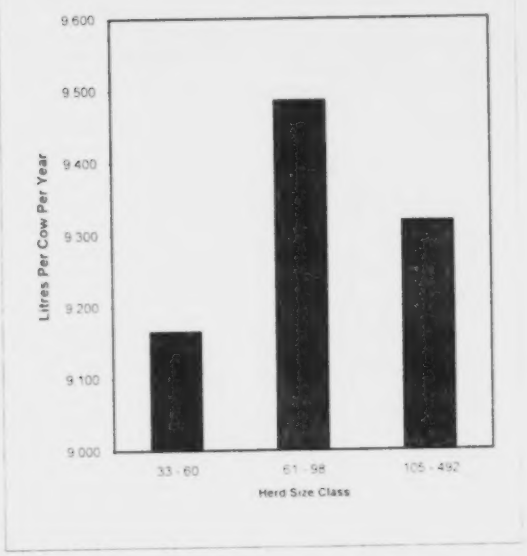
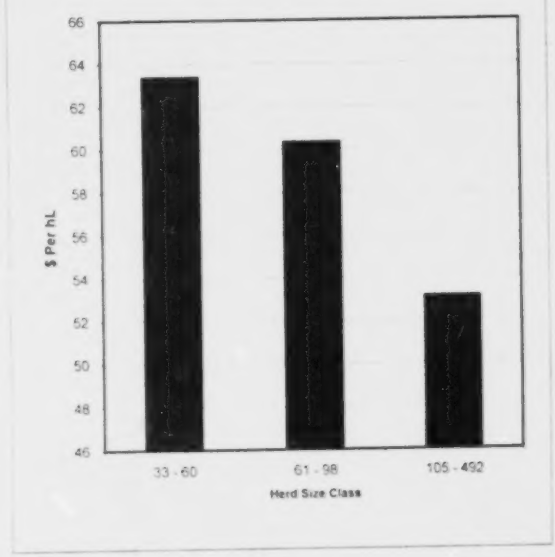


Figure 5 - Total Costs (2003)



Dairy Characteristics by Milk Production Class

Milk Production ranged between 6278 and 12,106 litres per cow per year. For this analysis, the sample group was split into the following three classes:

Bottom 1/3	6278 - 8796
Middle 1/3	8885 - 9756
Top 1/3	9935 - 12,106

Table 6 - Dairy Enterprise by Milk Production Class

	Bottom 1/3 6278 - 8796	Middle 1/3 8885 - 9756	Top 1/3 9935 - 12,106
Years in Dairy	22.90	18.45	16.64
Herd Size	110.22	101.89	86.62
Home Grown Feed (%)	73.54	64.45	76.91
Butterfat Test (%)	**3.68**	**3.58**	**3.55**
Gross Income ($/hL)	67.53	66.06	65.69
Total Costs ($/hL)	62.74	57.27	56.90
Feed Costs ($/hL)	**22.00**	**21.78**	**20.87**
Labour (hrs/cow)	64.53	60.22	69.37
Investment ($/cow)	10,270.11	10,795.20	12,476.71
Return to Equity (%)	7.96	14.75	14.38
Return to Investment (%)	5.06	9.05	8.29
Debt/Capital Ratio	0.31	0.40	0.35

Figures 6 and 7 illustrate Butterfat Test and Feed Costs results for the bottom, middle and top 1/3 groups (sorted by Milk Production Class).

Figure 6 - Butterfat Test (2003)

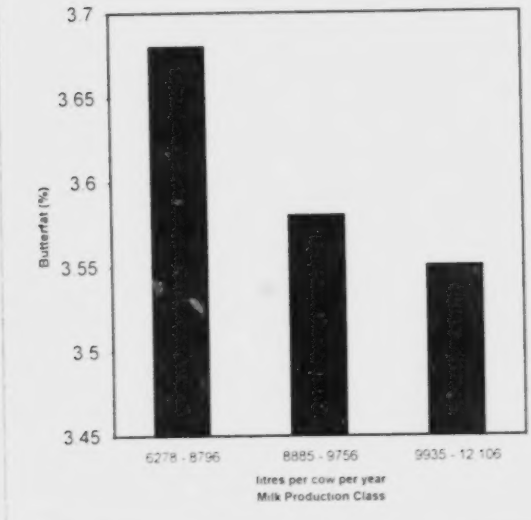
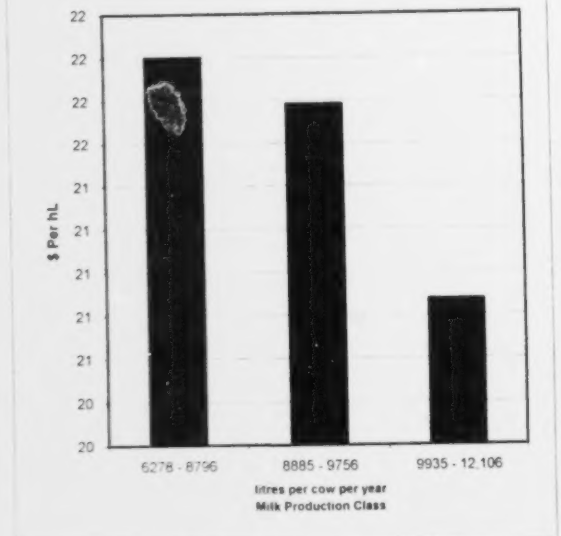


Figure 7 - Feed Costs (2003)



Dairy Characteristics by Gross Income Class

Gross Income ranged between $54.97 and $76.56 per hL sold. For this analysis, the sample group was split into the following three classes:

Bottom 1/3	54.97 - 65.21
Middle 1/3	65.23 - 67.98
Top 1/3	68.02 - 76.56

Table 7 - Dairy Enterprise by Gross Income Class

	Bottom 1/3 54.97 - 65.21	Middle 1/3 65.23 - 67.98	Top 1/3 68.02 - 76.56
Years in Dairy	**19.21**	**16.30**	**22.60**
Herd Size	100.04	111.61	86.61
Milk Production (litres/yr)	9,723.48	9,054.79	9,210.71
Home Grown Feed (%)	80.99	58.66	75.53
Butterfat Test (%)	3.53	3.59	3.68
Total Costs ($/hL)	54.69	59.92	62.17
Feed Costs($/hL)	20.88	22.19	21.57
Labour (hrs/cow)	**61.59**	**59.22**	**73.35**
Investment ($/cow)	10,653.12	11,657.99	11,189.82
Return to Equity (%)	15.79	10.58	10.91
Return to Investment (%)	7.99	6.37	8.17
Debt/Capital Ratio	0.37	0.41	0.28

Figures 8 and 9 illustrate Years in Dairy and Labour results for the bottom, middle and top 1/3 groups (sorted by Gross Income Class).

Figure 8 - Years in Dairy (2003)

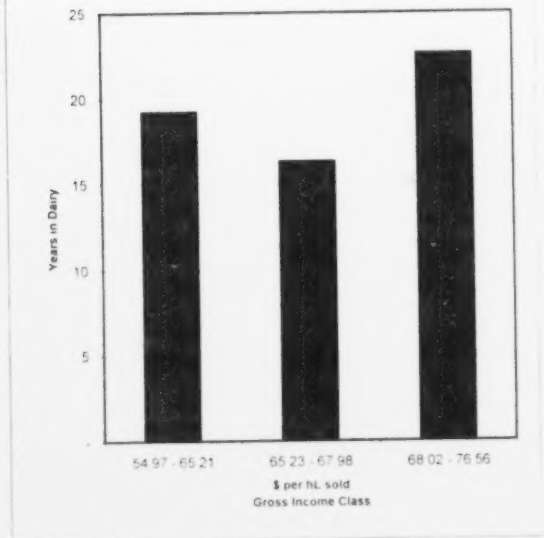
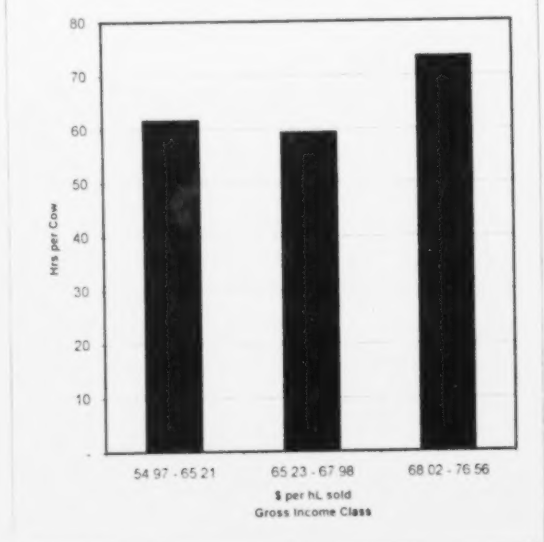


Figure 9 - Labour (hrs/cow) (2003)



Dairy Characteristics by Total Cost Class

Total Cost ranged between $41.62 and $94.65 per hL sold. For this analysis, the sample group was split into the following three classes:

Top 1/3	41.62 - 53.09
Middle 1/3	53.48 - 62.59
Bottom 1/3	62.85 - 94.65

Table 8 - Dairy Enterprise by Total Cost Class

	Top 1/3 41.62 - 53.09	Middle 1/3 53.48 - 62.59	Bottom 1/3 62.85 - 94.65
Years in Dairy	20.17	20.86	16.86
Herd Size	133.02	92.62	73.53
Milk Production (litres/yr)	**9,547.77**	**9,657.87**	**8,754.63**
Home Grown Feed (%)	77.12	78.43	58.69
Butterfat Test (%)	3.53	3.60	3.67
Gross Income ($/hL)	65.42	65.73	68.15
Feed Costs ($/hL)	19.71	20.40	24.60
Labour (hrs/cow)	52.50	62.38	79.13
Investment ($/cow)	9,475.06	12,539.73	11,444.15
Return to Equity (%)	**29.42**	**9.54**	**(1.62)**
Return to Investment (%)	16.77	6.72	(0.98)
Debt/Capital Ratio	0.34	0.32	0.41

Figures 10 and 11 illustrate Milk Production and Return to Equity results for the top, middle and bottom 1/3 groups (sorted by Total Cost Class).

Figure 10 - Milk Production (2003)

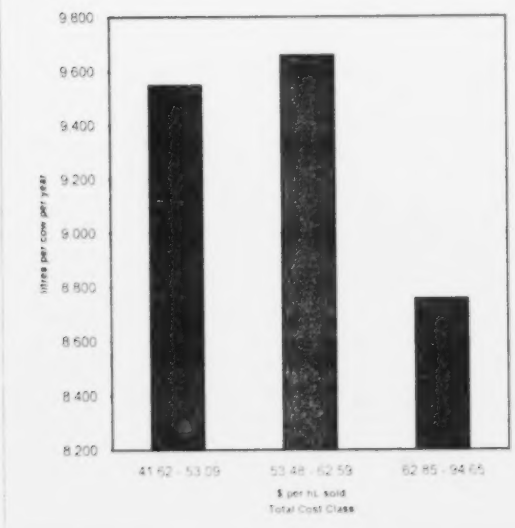
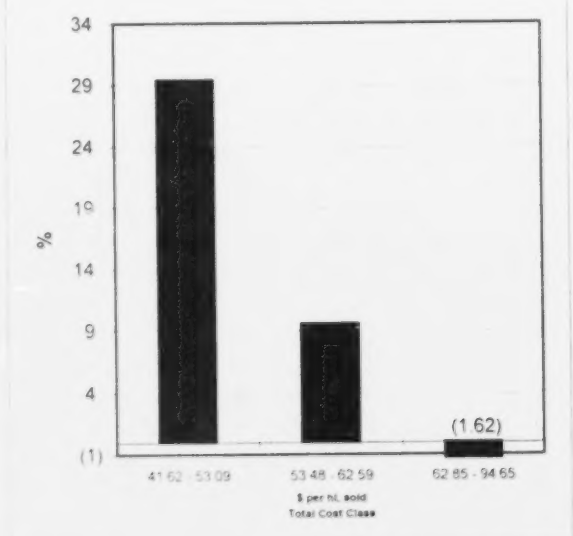


Figure 11 - Return to Equity (%) (2003)



Dairy Characteristics by Investment Class

Investment per cow ranged between $5409 and $17,796. For this analysis, the sample group was split into the following three classes:

Bottom 1/3	5409 - 9763
Middle 1/3	9838 - 12,262
Top 1/3	12,350 - 17,796

Table 9 - Dairy Enterprise by Investment Class

	Bottom 1/3 5409 - 9763	Middle 1/3 9838 - 12,262	Top 1/3 12,350 - 17,796
Years in Dairy	20.79	18.39	18.83
Herd Size	97.08	127.74	72.67
Milk Production (litres/yr)	9,172.88	9,216.07	9,592.36
Home Grown Feed (%)	77.83	72.83	63.84
Butterfat Test (%)	3.60	3.53	3.68
Gross Income ($/hL)	67.02	65.22	67.09
Total Costs ($/hL)	54.73	57.93	64.21
Feed Costs ($/hL)	21.52	22.00	21.12
Labour (hrs/cow)	**62.17**	**62.22**	**69.62**
Return to Equity (%)	**25.17**	**8.52**	**3.69**
Return to Investment (%)	13.89	6.38	2.26
Debt/Capital Ratio	0.34	0.33	0.39

Figures 12 and 13 illustrate Labour and Return to Equity results for the bottom, middle and top 1/3 groups (sorted by Investment Class).

Figure 12 -Labour (hrs/cow) (2003)

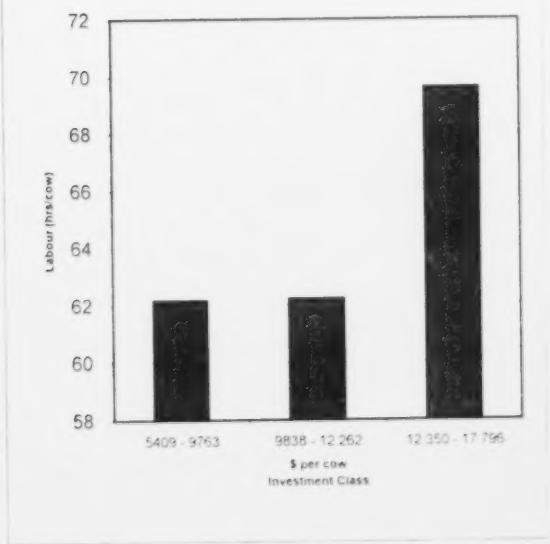
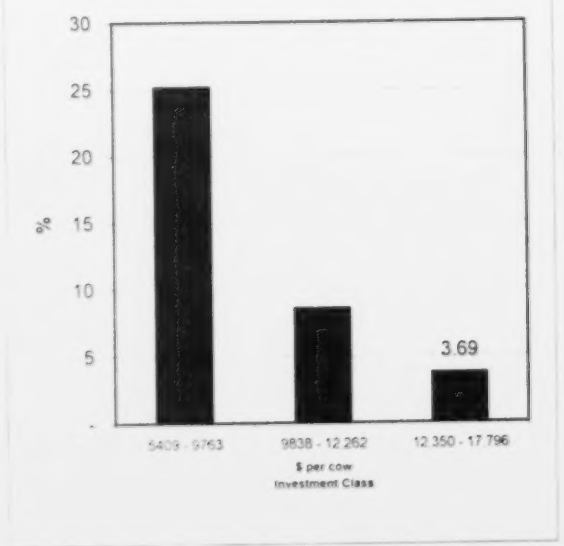


Figure 13 - Return to Equity (%) (2003)



Dairy Characteristics by Return to Equity Class

Return to Equity ranged between -17.06% and 86.75%. For this analysis, the sample group was split into the following three classes:

Bottom 1/3	(17.06) - 4.71
Middle 1/3	4.92 - 17.70
Top 1/3	18.04 - 86.75

Table 10 - Dairy Enterprise by Return to Equity Class

	Bottom 1/3 (17.06) - 4.71	Middle 1/3 4.92 - 17.70	Top 1/3 18.04 - 86.75
Years in Dairy	15.19	23.41	19.17
Herd Size	73.46	95.22	130.35
Milk Production (litres/yr)	8,989.89	9,499.70	9,478.21
Home Grown Feed (%)	54.53	85.42	73.95
Butterfat Test (%)	3.61	3.65	3.54
Gross Income ($/hL)	**65.71**	**67.27**	**66.24**
Total Costs ($/hL)	**69.03**	**58.33**	**49.50**
Feed Costs ($/hL)	23.91	20.66	20.14
Labour (hrs/cow)	73.37	67.51	52.89
Investment ($/cow)	12,302.74	11,870.19	9,317.90
Return to Investment (%)	(2.01)	7.38	17.11
Debt/Capital Ratio	0.41	0.29	0.37

Figures 14 and 15 illustrate Gross Income and Total Costs results for the bottom, middle and top 1/3 groups (sorted by Return to Equity Class).

Figure 14 - Gross Income (2003)

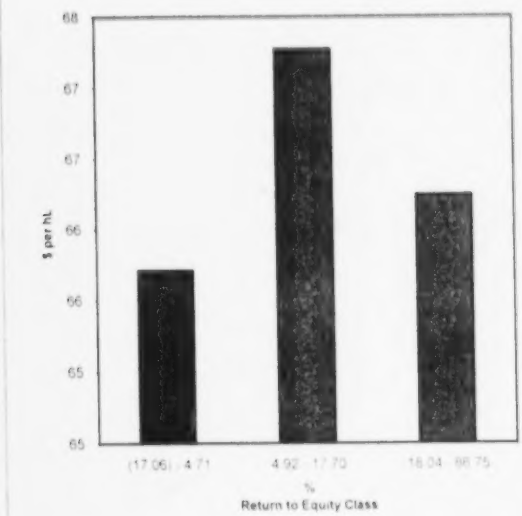
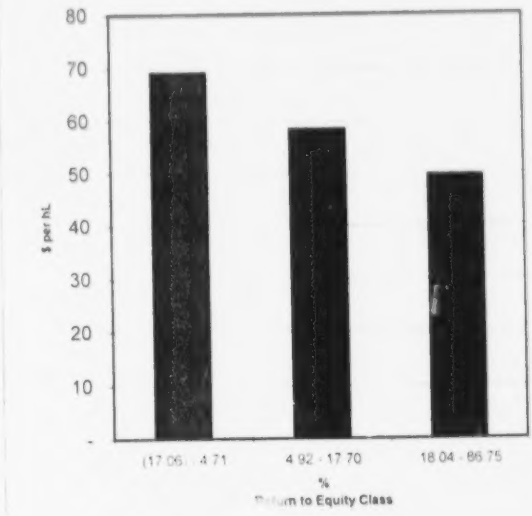


Figure 15 - Total Costs (2003)



Detailed Management Factors, Northern and Southern Alberta

Table 11 provides a further examination of regional differences from a management perspective.

Table 11

Detailed Management Factors, Northern and Southern Alberta, 2003

	Northern Alberta	Southern Alberta
Herd Size	96.93	102.28
Milk Production (litres/cow/year)	9,119.35	9,404.67
Feed Conversion (litres/kg)	2.19	2.17
Labour Productivity (litres/hr)	153.90	168.22
Labour Hours/Cow(hrs)	59.26	55.91
Investment/Cow ($/cow)	10,835.57	11,029.37
Milk Production/$ Invest (litres/$)	0.84	0.85
Feed Costs ($/cow)	1,819.68	2,045.01
Purchased Barley ($/tonne)	138.98	143.24
Cost of Purchased Alfalfa Hay ($/tonne)	161.59	133.26
Use of Home Grown Roughage (%)	61.64	75.79
Butterfat Test (kg/hL)	3.56	3.64
Protein (kg/hL)	3.24	3.24
LOS (kg/hL)	5.64	5.60
Total Costs ($/hL)	55.99	56.53
Contribution Margin ($/hL)	21.20	19.49
Return to Investment (%)	10.8	9.7
Return to Equity ($/hL)	10.66	9.06
Return to Equity (%)	13.5	12.5
Debt to Asset Ratio (%)	0.35	0.40

Historical Economic Trends

Figure 16 - Average Milk Price
($ per hL)

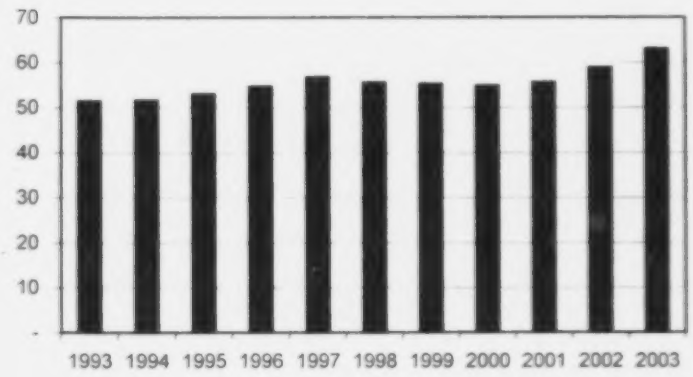


Figure 17 - Feed Cost
($ per hL)

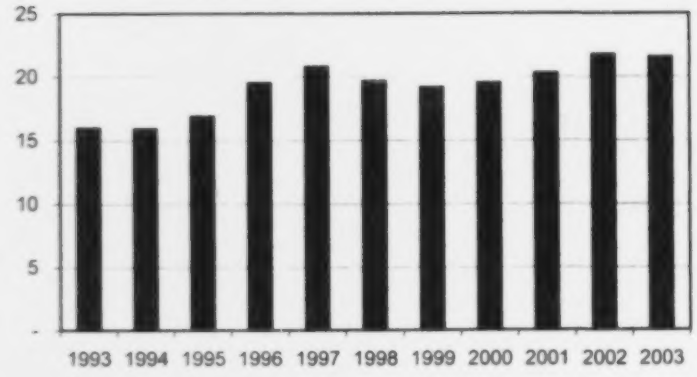


Figure 18 - Total Cost
($ per hL)

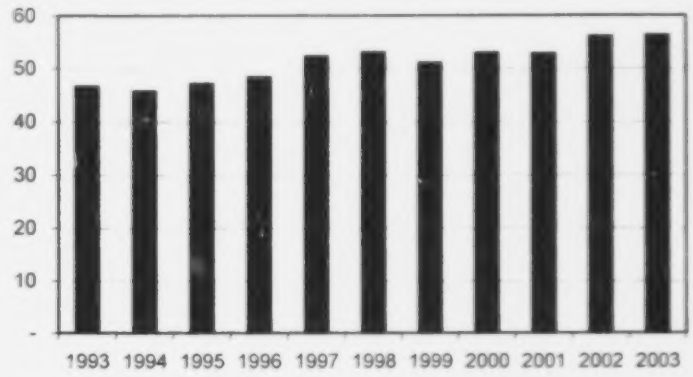


Figure 19 - Return to Equity
(%)

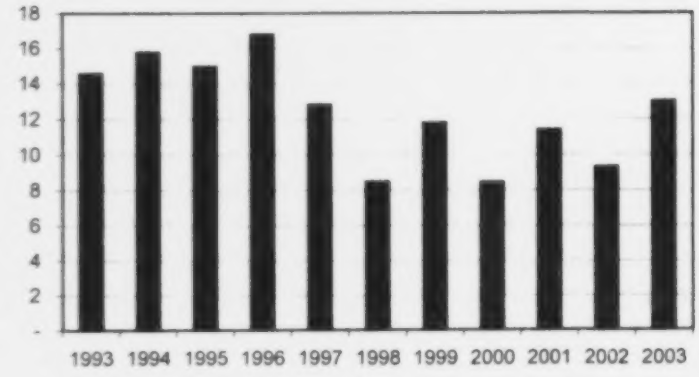


Figure 20 - Median Size of Dairy Herd

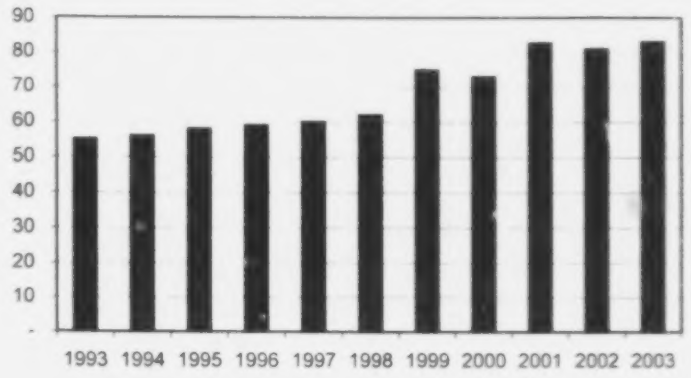


Figure 21 - Milk Production
(litres per year)

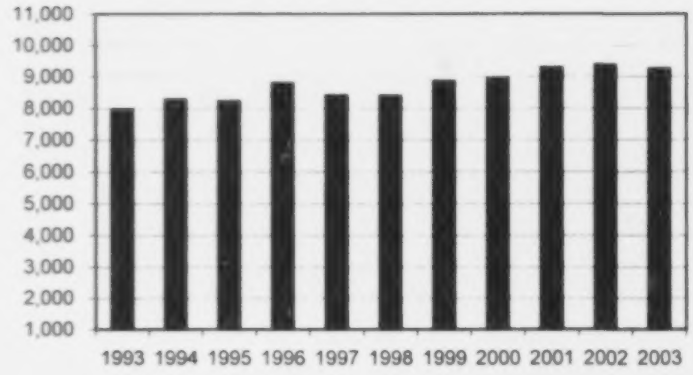


Figure 22 - Purchased Barley Cost
($ per tonne)

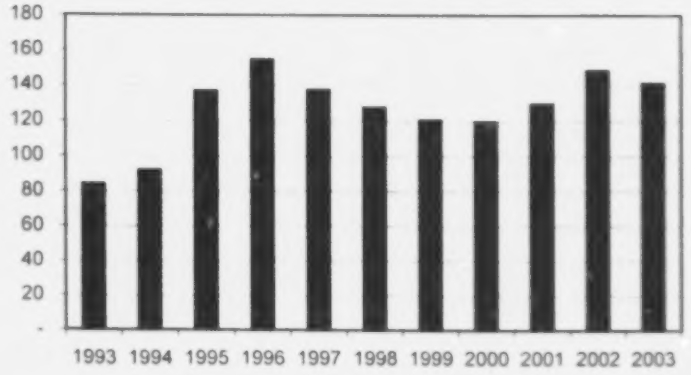
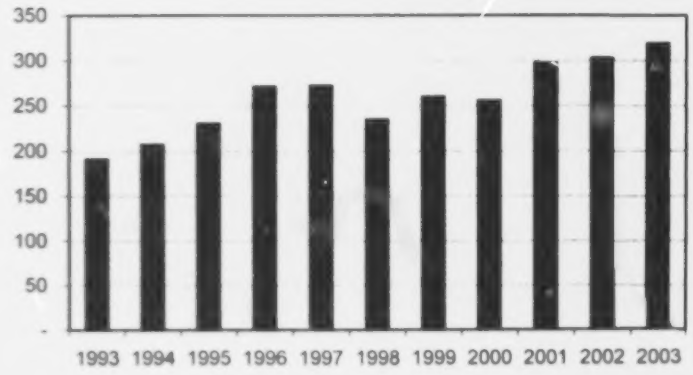


Figure 23 - Cost of Dairy Ration
($ per tonne)



Economic Implications of BSE

Dairy farms typically receive 5 to 6 percent of their revenue from livestock sales, primarily cull cows and bull calves. This amounts to $3 to $4 per hL. The BSE incident in May 2003 caused cull cow and calf prices to plummet. In addition, some cows that normally would have been culled were maintained in the milking herd or moved to the dry cow category in hopes of higher future prices. The lower volume and value of livestock sales in the second half of 2003 resulted in a decline in the average annual livestock sales to $1.49 per hL.

Other issues relate to the net animal inventory change calculations for 2003. The average number of cows increased over the year from 98.8 to 104.3. Much of this increase is likely due to normal growth trends in herd size, as a number of participants indicated substantial purchases of cows, or transfer of cows in from the dry cow or heifer category. However, some of this growth may be due to the retention of cull cows in light of low cow prices. Producers should assess whether it would be more profitable to replace aging cows with more productive stock, in spite of low cull prices.

Consistent with previous years and other cost and return studies, the price used to calculate the value of opening and closing inventories of livestock is the average annual price, and not estimated opening and closing year prices. Animal prices are primarily derived from the current production value of the dairy herd, but also include anticipated cull values (salvage value) in the future. The BSE situation should only have impacted the salvage value of cows, not the production value. In addition, younger cows will have smaller salvage value discounts in anticipation of prices eventually rising. Nevertheless, using the annual average price for the ending inventory valuation tends to over-estimate the ending inventory values considering low cull cow values in late 2003.

It is difficult to determine the extent to which the ending inventory is over-valued for several reasons. It is not known how many cows have been retained in the milking herd beyond their normal milking life, nor the degree of production losses from these cows. As well, it is difficult

to anticipate cow prices in the months ahead. Since the ending inventory values are inflated to a small degree, the revenue estimates (which include the net inventory change) and the net return to equity estimates, are also inflated to some degree. When cattle prices eventually rebound, this dairy study will similarly under-estimate the net inventory change, and return to equity.

Dairy Enterprise Investment and Debt Levels

Total dairy farm investment (excluding quota) rose only slightly to $1,089,244 per farm in 2003, compared to an average of $1,032,617 in 2002. Of this total amount, 71.4 percent was comprised of buildings and equipment investment, 22.8 percent referred to livestock investment, and the remaining 5.8 percent was invested in land and supplies. On a per cow basis, this worked out to $10,935 in 2003, only a slight decrease from 2002 (Table 12).

Table 12

Annual Investment and Debt on Dairy Farms

	2001	2002	2003
	--- $ Per Cow ---		
Land	587	435	471
Buildings and Equipment	6,999	7,494	7,808
Livestock	2,490	2,899	2,495
Supplies	131	163	161
TOTAL	**10,207**	**10,991**	**10,935**
Debt	3,972	4,048	4,146
Equity	6,235	6,943	6,789
TOTAL	**10,207**	**10,991**	**10,935**

The debt/capital ratio decreased marginally to 38 per cent in 2003. For the past four years it has been fairly constant, ranging between 37 and 39 per cent. This ratio measures the extent of external financing on dairy farms in Alberta.

Debt Repayment Capacity

The acceptable debt load or repayment capacity of a dairy enterprise can be measured by the contribution margin. Contribution margin is the difference between gross income and variable costs. Therefore, it represents the amount of money available to pay for capital assets - rent, mortgage payments (principle and interest), and taxes. The amount of cash remaining after capital assets payments is the producer's return to owner equity, or profit. A summary of contribution margins for the dairy years 2001, 2002, and 2003 is presented in Table 13.

Table 13

Summary of Average Costs and Returns in Alberta

2001 - 2003

	2001	2002	2003	2001-2003
		------ $ Per Cow ------		
A. Gross Income	5,462	5,731	5,936	5,710
B. Feed Costs	1,827	1,974	1,935	1,912
C. Variable Costs	2,081	2,168	2,176	2,142
Contribution Margin (A - B - C)	1,554	1,589	1,825	1,656

The contribution margin can be used to determine the amount of debt load that a farm enterprise can carry. Table 14 shows the total debt load that a farm enterprise can carry on a per cow basis at various interest rates and various cow productivity levels. It is based on the average costs and returns between 2001 and 2003. The assumptions behind the analysis are that feed costs vary directly with the level of production, while other operating costs such as labour, maintenance, and repairs remain relatively unchanged at the three-year average of $2,142 per cow.

Table 14

Acceptable Total Debt-Load per Cow in Alberta, 2001-2003*

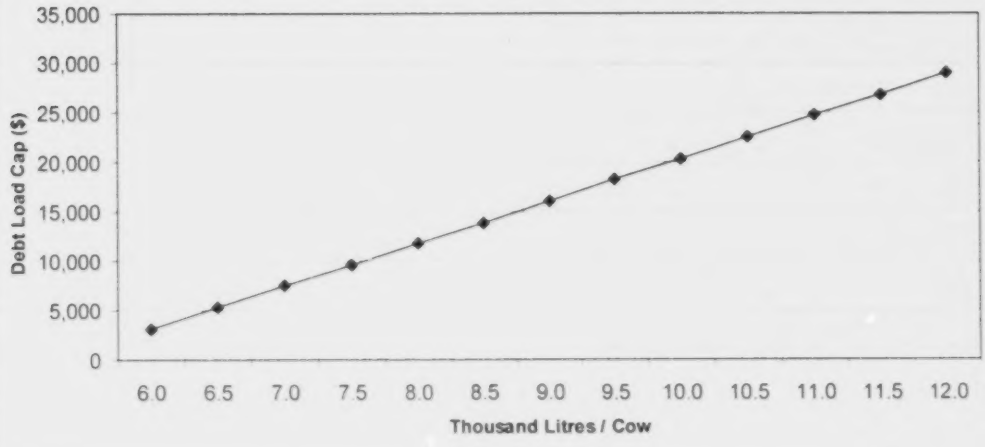
Milk Productivity (litres/cow)	Interest Rates 5%	6%	7%	8%	9%	10%
6,000	3,686	3,392	3,133	2,904	2,700	2,518
6,500	6,217	5,722	5,285	4,898	4,554	4,247
7,000	8,749	8,052	7,437	6,892	6,408	5,977
7,500	11,280	10,382	9,589	8,887	8,263	7,706
8,000	13,812	12,712	11,741	10,881	10,117	9,435
8,500	16,343	15,042	13,893	12,876	11,971	11,165
9,000	18,875	17,372	16,045	14,870	13,826	12,894
9,500	21,406	19,702	18,197	16,864	15,680	14,624
10,000	23,938	22,032	20,349	18,859	17,534	16,353
10,500	26,469	24,361	22,501	20,853	19,388	18,082
11,000	29,000	26,691	24,653	22,848	21,243	19,812
11,500	31,532	29,021	26,805	24,842	23,097	21,541
12,000	34,063	31,351	28,957	26,836	24,951	23,270

* With a 20 year repayment period

For example, at a milk production level of 8,000 litres per cow, the contribution margin would be $1,108 per cow. This margin, if amortized over 20 years at 7% interest, results in a debt carrying capacity of $11,741 per cow.

Figure 24 shows the impact of milk productivity on the debt load carrying capacity of dairy enterprises given an interest rate of 7%. As productivity declines, the debt carrying capacity of each cow also declines. Conversely, the debt carrying capacity rises as productivity increases. Contribution margins become negative at production levels below about 5,270 litres per cow.

Figure 24 - Debt Load Capacity / Cow (2001-2003)
(7% interest rate, 20 year payback)



Another way to use this information is to measure the minimum level of productivity required to carry a given debt load at a specific interest rate. The average annual investment for 2003 was estimated at $10,935 per cow, while the average debt was $4,146 per cow. At an interest rate of 7%, this amount of debt per cow would only be supported at production levels of about 6,230 litres per cow and above (Table 14). In general, as productivity increases and/or interest rates fall, debt repayment or financing capacity increases.

To this point, the value of quota has not been included in the analysis. If externally financed quota valued at $22,778 per cow (the average value of quota for one cow in the 2003 Dairy Cost Study) is added to current debt of $4,146 per cow, the total amount of debt load per cow would be $26,924. The ability to carry this amount of debt per cow is dependent upon the prevailing interest rate and the productivity of each cow carrying debt. As illustrated in Table 14, this level of debt would require a production level of close to 12,000 litres per cow, assuming an interest rate of 7%.

Impact of Quota Values on Dairy Returns

The cost and return analysis in this study does not include any value for milk quota. However, new entrants into the dairy business would have to purchase quota. When the financing of these quota purchases (at 2003 Dairy Cost Study average prices) is taken into account, the average rate of return for new entrants would be a negative 5.6% (Table 15). This means that the borrowing costs of capital used to purchase quota exceeded the financial returns obtained from producing milk. Borrowing costs were high as a result of the high quota prices for both fluid and industrial production. The assumption in this analysis is that all funds needed to purchase quota were borrowed at 5.89%, the average interest rate in the study.

Table 15

Impact of Quota Value on Dairy Returns, 2003

	2003 Study Average	Including Quota Value*
	--- $ per Farm ---	
Dairy Investment	1,089,243	3,229,266
Debt	412,980	2,553,003
Equity	676,263	676,263
	--- $ per hL Sold ---	
Equity	75.64	75.64
Gross Income	66.10	66.10
Production Costs	56.27	56.27
Interest Cost for Quota		14.10
Potential Total Cost	56.27	70.37
Return to Equity($ per hL)	9.83	-4.27
Return to Equity (%)	13.0	-5.6

*Applicable to new entrants who borrow 100% of funds needed to purchase fluid and MSQ at the average quota values from the 2003 Dairy Cost Study (fluid quota - $888.69 per litre, MSQ - $57.40 per kg.)

APPENDIX A

Alberta

Average Dairy Farm Summary

2003

Alberta

2003 Dairy Cost Study - Business Analysis

64 Participants

Table 1 Dairy Enterprise Costs and Returns

	TOTAL ENTERPRISE	PER COW	PER HL SOLD	PERCENT FROM INCOME
INCOME:				
MILK SALES	582,542.76	5,848.27	65.12	
MILK SUBSIDY	.00	.00	.00	
POOL ADJUSTMENTS (+ -)	(18,900.56)	(189.75)	(2.11)	
MISCELLANEOUS RECEIPTS	1,322.31	13.27	.15	
NET CATTLE SALES (+ -)	13,309.15	133.61	1.49	
NET INVENTORY CHANGE (+ -)	13,030.13	130.81	1.46	
GROSS INCOME	**591,303.80**	**5,936.23**	**66.10**	**100.00**
EXPENSES:				
GRAIN	23,789.28	238.83	2.66	
COMPLETE FEED	63,823.75	640.74	7.13	
SUPPLEMENT	26,875.64	269.81	3.00	
MINERALS & VITAMINS	2,521.68	25.32	.28	
ROUGHAGE	74,652.10	749.45	8.34	
PROCESSING COSTS	1,118.49	11.23	.13	
TOTAL FEED COSTS	**192,780.94**	**1,935.37**	**21.55**	**32.60**
BEDDING AND SUPPLIES	18,413.72	184.86	2.06	
BREEDING	7,519.80	75.49	.84	
VET. AND MEDICINE	13,965.34	140.20	1.56	
MILK HAULING	17,935.85	180.06	2.00	
PRODUCER'S FEES	13,499.43	135.52	1.51	
UTILITIES	15,347.79	154.08	1.72	
FUEL, OIL, LUBE	5,874.70	58.98	.66	
BLDG. & MACH. REPAIRS	17,356.96	174.25	1.94	
MISCELLANEOUS	22,688.26	227.77	2.54	
TOTAL OTHER VARIABLE COSTS	**132,601.85**	**1,331.22**	**14.82**	**22.43**
HIRED LABOUR	28,901.59	290.15	3.23	
FAMILY LABOUR	55,289.50	555.06	6.18	
TOTAL LABOUR COSTS	**84,191.09**	**845.21**	**9.41**	**14.24**
TOTAL VARIABLE COSTS	**409,573.88**	**4,111.80**	**45.78**	**69.27**
RENT	2,495.01	25.05	.28	
TAXES AND INSURANCE	8,824.24	88.59	.99	
DEPRECIATION	58,174.23	584.02	6.50	
INTEREST (CAP DEBT)	24,327.15	244.23	2.72	
TOTAL CAPITAL COSTS	**93,820.64**	**941.89**	**10.49**	**15.87**
TOTAL PRODUCTION COSTS	**503,394.52**	**5,053.69**	**56.27**	**85.13**
CONTRIBUTION MARGIN ($)	181,729.91	1,824.43	20.31	
RETURN TO EQUITY ($)	87,909.27	882.54	9.83	14.87
MILK PRICE			63.01	
INVENTORY ADJUSTMENT			3.09	
RETURN TO EQUITY (%)			13.00	
AVERAGE CAP. DEBT INTEREST RATE (%)			5.89	

Alberta
2003 Dairy Cost Study - Business Analysis
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Table 2 Statement of Investment

LAND BUILDINGS & EQUIPMENT	AGE	DEPRECIATION	DAIRY INVESTMENT
DAIRY BUILDINGS	9.56	24,529.14	**596,364.08**
POWER MACHINERY	6.00	12,656.77	87,329.93
DAIRY EQUIPMENT	8.62	13,598.29	59,797.41
OTHER EQUIPMENT	7.14	7,390.03	34,316.99
TOTAL EQUIPMENT	**7.02**	**33,645.10**	**181,444.34**
LAND			46,906.88
SUPPLIES			16,015.24
** SUBTOTAL **		**58,174.23**	**840,730.53**

DAIRY LIVESTOCK	--- BEGIN YEAR --- NUMBER	VALUE	--- END OF YEAR --- NUMBER	VALUE	AVERAGE VALUE
COWS	98.83	164,801.76	104.34	173,999.40	169,400.58
BRED HEIFERS	29.63	41,475.00	31.94	44,712.50	43,093.75
OPEN HEIFERS	26.94	26,937.50	26.92	26,921.88	26,929.69
HEIFER CALVES	27.70	6,925.78	29.81	7,453.13	7,189.45
BULL CALVES	7.13	498.75	8.98	628.91	563.83
BULLS	91	1,359.38	88	1,312.50	1,335.94
** SUBTOTAL **	**191.13**	**241,998.17**	**202.88**	**255,028.30**	**248,513.24**

TOTAL DAIRY INVESTMENT	**1,089,243.76**
CAPITAL LOANS	412,980.86
OPERATOR EQUITY	676,262.90
INVESTMENT PER COW	10,935.15
DEBT/CAPITAL RATIO	38
CAPITAL TURNOVER (YR)	1.84

HERD SIZE	Average	Median
NUMBER OF DAIRY COWS	99.61	83.17
NUMBER OF ANIMAL UNITS	152.66	122.67
DRY COWS (%)	16.64	
CALF CROP (%)	93.19	
PASTURE PER COW (AC)	35	

CATTLE SALES & PURCHASES	NUMBER	SELLING PRICE	NUMBER	PURCHASE PRICE
COWS	20.34	731.30	3.13	1,470.87
BRED HEIFERS	1.39	1,455.66	1.09	1,703.84
OPEN HEIFERS	.53	999.01	.11	2,935.71
HEIFER CALVES	.36	472.61	1.06	212.94
BULL CALVES	27.53	94.25	.00	.00
BULLS	.36	1,197.59	.22	1,421.43
TOTAL VALUE		**20,627.46**		**7,318.31**

Alberta
2003 Dairy Cost Study - Business Analysis
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Table 3 Labour and Management

LABOUR

	HOURS	VALUE	HOURLY RATE
OPERATOR LABOUR	2,553.76	38,306.36	15.00
HIRED LABOUR	1,973.29	28,901.59	14.65
FAMILY UNPAID LABOUR	1,204.14	16,983.14	14.10
TOTAL	**5,731.19**	**84,191.09**	**14.69**

RETURN TO FAMILY LABOUR	18.31
MAN EQUIVALENTS	2.29
LABOUR HOURS PER COW	57.54
YEARS FARMING	19.32

MILK PRODUCTION

	HL.	% OF TOTAL	VALUE	PRICE
CLASS I MILK	4,678.93	50.69	335,637.75	71.73
INDUSTRIAL MILK	4,106.02	44.49	245,407.86	59.77
4M MILK	154.63	1.68	1,484.34	9.60
CONTRACTED EXPORT MILK	63	.01	12.81	20.24
SUB-TOTAL	8,940.21	96.86	582,542.76	65.16
OTHER MILK SALES	5.70	.06	.00	.00
FED TO LIVESTOCK	283.73	3.07	18,534.59	65.32
TOTAL	**9,229.65**	**100.00**	**601,077.35**	**65.12**

FLUID QUOTA	1,469.45 LITRES/DAY
MSQ QUOTA	14,532.00 KG/YR
FLUID QUOTA PRICE	888.69 $/LITRE
FLUID QUOTA LEASED PRICE	.27 $/LITRE
MSQ QUOTA PRICE	57.40 $/KG
MSQ QUOTA LEASED PRICE	7.86 $/KG
CLASS 1 UTILIZATION	84.88 %

		COMPONENT PRICES ($/KG)		
		CLASS I	EXCESS	WORLD
BUTTERFAT TEST	3.60 KG/HL	4.71	6.37	.83
PROTEIN	3.24 KG/HL		7.66	.79
L.O.S.	5.62 KG/HL		1.87	.79

MILK PRODUCTION PER COW 9,265.84 LITRES / YEAR

MANAGEMENT FACTORS

COST PER HL	56.27
CEM COST PER HL	32.86
MILK/FEED (KG) RATIO	2.18 LITRES
MILK/LABOUR (HR) RATIO	161.04 LITRES
MILK/CAPITAL ($) RATIO	.85 LITRES

Alberta
2003 Dairy Cost Study - Business Analysis
64 Participants
Table 4 Feed Report

		— PURCHASED —		— HOMEGROWN—	
CONCENTRATES		**QUANTITY (TONNES)**	**PRICE**	**QUANTITY (TONNES)**	**PRICE**
OATS		00	00	87	154 73
BARLEY		38 05	141 38	57 84	134 89
WHEAT		1 69	180 00	00	00
MIXED GRAIN		00	00	00	00
BREW GRAIN (DRY EQ)		7 88	209 93		
BEET PULP		81	239 50		
OTHER PURCHASED		45 42	183 24		
DAIRY RATION		186 34	319 09		
CALF FEED		11 93	324 00		
MILK REPLACER		21	2,388 40		
SUPPLEMENT		68 41	391 54		
MOLASSES		29	321 32		
SALT		37	275 63		
MINERALS & VITAMINS		3 99	607 40		
SUBTOTAL		**365.36**	**109,073.61**	**58.71**	**7,936.74**
ROUGHAGE					
ALFALFA HAY		78 38	149 43	109 73	122 87
ALFALFA PELLETS		95	176 69		
STRAW FED		6 49	71 00	3 94	53 61
GREENFEED		30	135 40	5 03	86 07
SILAGE/HAYLAGE (DRY EQ)		113 44	105 26	326 51	110 88
SUBTOTAL		**199.56**	**24,321.56**	**445.21**	**50,330.55**
GRINDING & PROCESSING			1,118 49		
GRAND TOTAL FEED COSTS			**134,513.66**		**58,267.29**
BEDDING		93 77	55 12	57 90	53 39

AV PRICE	CONCENTRATE	275 92 $/TONNE
	ROUGHAGE	115 78 $/TONNE
FED PER COW	CONCENTRATE	4 26 TONNES
	ROUGHAGE	6 47 TONNES
% HOME GROWN	CONCENTRATE	13 84 %
	ROUGHAGE	69 05 %

APPENDIX B

Northern Alberta

Average Dairy Farm Summary

2003

Northern Alberta
2003 Dairy Cost Study - Business Analysis
32 Participants
Table 1 Dairy Enterprise Costs and Returns

	TOTAL ENTERPRISE	PER COW	PER HL SOLD	PERCENT FROM INCOME
INCOME:				
MILK SALES	565,005.02	5,828.71	65.78	
MILK SUBSIDY	.00	.00	.00	
POOL ADJUSTMENTS (+ -)	(17,196.62)	(177.40)	(2.00)	
MISCELLANEOUS RECEIPTS	1,431.49	14.77	.17	
NET CATTLE SALES (+ -)	7,497.15	77.34	.87	
NET INVENTORY CHANGE (+ -)	15,728.45	162.26	1.83	
GROSS INCOME	**572,465.49**	**5,905.67**	**66.64**	**100.00**
EXPENSES:				
GRAIN	32,177.94	331.95	3.75	
COMPLETE FEED	50,264.82	518.54	5.85	
SUPPLEMENT	16,284.25	167.99	1.90	
MINERALS & VITAMINS	3,859.57	39.82	.45	
ROUGHAGE	72,075.21	743.54	8.39	
PROCESSING COSTS	1,728.27	17.83	.20	
TOTAL FEED COSTS	**176,390.07**	**1,819.68**	**20.53**	**30.81**
BEDDING AND SUPPLIES	17,515.99	180.70	2.04	
BREEDING	7,618.30	78.59	.89	
VET. AND MEDICINE	14,148.27	145.96	1.65	
MILK HAULING	17,351.87	179.01	2.02	
PRODUCER'S FEES	12,835.99	132.42	1.49	
UTILITIES	15,783.27	162.82	1.84	
FUEL, OIL, LUBE	5,595.20	57.72	.65	
BLDG. & MACH. REPAIRS	18,242.98	188.20	2.12	
MISCELLANEOUS	20,011.09	206.44	2.33	
TOTAL OTHER VARIABLE COSTS	**129,102.96**	**1,331.85**	**15.03**	**22.55**
HIRED LABOUR	27,362.92	282.28	3.19	
FAMILY LABOUR	57,471.21	592.88	6.69	
TOTAL LABOUR COSTS	**84,834.13**	**875.17**	**9.88**	**14.82**
TOTAL VARIABLE COSTS	**390,327.15**	**4,026.69**	**45.44**	**68.18**
RENT	2,369.55	24.44	.28	
TAXES AND INSURANCE	7,884.05	81.33	.92	
DEPRECIATION	57,652.60	594.76	6.71	
INTEREST (CAP DEBT)	22,674.99	233.92	2.64	
TOTAL CAPITAL COSTS	**90,581.19**	**934.45**	**10.55**	**15.82**
TOTAL PRODUCTION COSTS	**480,908.34**	**4,961.15**	**55.99**	**84.01**
CONTRIBUTION MARGIN ($)	182,138.34	1,878.98	21.20	
RETURN TO EQUITY ($)	91,557.15	944.52	10.66	15.99
MILK PRICE			63.77	
INVENTORY ADJUSTMENT			2.87	
RETURN TO EQUITY (%)			13.51	
AVERAGE CAP. DEBT INTEREST RATE (%)			6.08	

Northern Alberta
2003 Dairy Cost Study - Business Analysis
32 Participants
Table 2 Statement of Investment

LAND BUILDINGS & EQUIPMENT	AGE	DEPRECIATION	DAIRY INVESTMENT
DAIRY BUILDINGS	10.21	22,906.02	**559,889.50**
POWER MACHINERY	6.50	13,062.05	89,472.06
DAIRY EQUIPMENT	8.59	14,852.68	65,374.50
OTHER EQUIPMENT	5.64	6,831.85	32,295.13
TOTAL EQUIPMENT	**7.22**	**34,746.58**	**187,141.70**
LAND			46,231.95
SUPPLIES			19,538.98
** SUBTOTAL **		57,652.60	**812,802.13**

DAIRY LIVESTOCK	— BEGIN YEAR — NUMBER	VALUE	— END OF YEAR — NUMBER	VALUE	AVERAGE VALUE
COWS	96.06	158,360.49	102.16	168,406.13	163,383.31
BRED HEIFERS	25.25	35,350.00	28.91	40,468.75	37,909.38
OPEN HEIFERS	27.47	27,468.75	27.94	27,937.50	27,703.13
HEIFER CALVES	28.72	7,179.69	28.59	7,148.44	7,164.06
BULL CALVES	7.47	522.81	7.94	555.63	539.22
BULLS	53	796.88	59	890.63	843.75
** SUBTOTAL **	**185.50**	**229,678.62**	**196.13**	**245,407.07**	**237,542.84**

TOTAL DAIRY INVESTMENT	**1,050,344.97**
CAPITAL LOANS	372,657.99
OPERATOR EQUITY	677,686.98
INVESTMENT PER COW	10,835.57
DEBT/CAPITAL RATIO	.35
CAPITAL TURNOVER (YR)	1.83

HERD SIZE	Average	Median
NUMBER OF DAIRY COWS	96.93	72.13
NUMBER OF ANIMAL UNITS	147.60	112.79
DRY COWS (%)	15.57	
CALF CROP (%)	92.88	
PASTURE PER COW (AC)	4.9	

CATTLE SALES & PURCHASES	NUMBER	SELLING PRICE	NUMBER	PURCHASE PRICE
COWS	20.41	617.38	4.72	1,428.30
BRED HEIFERS	.72	1,375.15	.53	2,193.47
OPEN HEIFERS	.47	521.37	.06	3,225.00
HEIFER CALVES	.31	108.80	.19	200.00
BULL CALVES	23.16	85.10	.00	.00
BULLS	.06	988.50	.19	1,366.67
TOTAL VALUE		**15,897.53**		**8,400.38**

Northern Alberta
2003 Dairy Cost Study - Business Analysis
32 Participants
Table 3 Labour and Management

LABOUR

	HOURS	VALUE	HOURLY RATE
OPERATOR LABOUR	2,664.77	39,971.60	15.00
HIRED LABOUR	1,821.96	27,362.92	15.02
FAMILY UNPAID LABOUR	1,257.28	17,499.61	13.92
TOTAL	**5,744.02**	**84,834.13**	**14.77**

RETURN TO FAMILY LABOUR	18.99
MAN EQUIVALENTS	2.30
LABOUR HOURS PER COW	59.26
YEARS FARMING	18.59

MILK PRODUCTION

	HL.	% OF TOTAL	VALUE	PRICE
CLASS I MILK	4,782.96	54.11	342,708.68	71.65
INDUSTRIAL MILK	3,686.02	41.70	221,097.11	59.98
4M MILK	119.60	1.35	1,173.63	9.81
CONTRACTED EXPORT MILK	1.27	01	25.61	20.24
SUB-TOTAL	8,589.84	97.17	565,005.02	65.78
OTHER MILK SALES	00	00	00	00
FED TO LIVESTOCK	249.99	2.83	16,450.34	65.80
TOTAL	**8,839.83**	**100.00**	**581,455.36**	**65.78**

FLUID QUOTA	1,496.41 LITRES/DAY
MSQ QUOTA	13,184.38 KG/YR
FLUID QUOTA PRICE	883.17 $/LITRE
FLUID QUOTA LEASED PRICE	23 $/LITRE
MSQ QUOTA PRICE	57.50 $/KG
MSQ QUOTA LEASED PRICE	8.13 $/KG
CLASS 1 UTILIZATION	84.88 %

		COMPONENT PRICES ($/KG)		
		CLASS I	EXCESS	WORLD
BUTTERFAT TEST	3.56 KG/HL	4.47	6.37	80
PROTEIN	3.24 KG/HL		7.68	79
L.O.S.	5.64 KG/HL		1.87	80

MILK PRODUCTION PER COW 9,119.35 LITRES / YEAR

MANAGEMENT FACTORS

COST PER HL	55.99
CEM COST PER HL	32.05
MILK/FEED (KG) RATIO	2.19 LITRES
MILK/LABOUR (HR) RATIO	153.90 LITRES
MILK/CAPITAL ($) RATIO	.84 LITRES

Northern Alberta
2003 Dairy Cost Study - Business Analysis
32 Participants
Table 4 Feed Report

	--- PURCHASED ---		--- HOMEGROWN---	
CONCENTRATES	**QUANTITY (TONNES)**	**PRICE**	**QUANTITY (TONNES)**	**PRICE**
OATS	.00	.00	1.09	147.70
BARLEY	33.12	138.98	85.25	129.61
WHEAT	3.38	180.00	.00	.00
MIXED GRAIN	.00	.00	.00	.00
BREW GRAIN (DRY EQ.)	14.45	213.88		
BEET PULP	1.60	239.07		
OTHER PURCHASED	59.09	207.86		
DAIRY RATION	151.36	313.72		
CALF FEED	6.22	349.73		
MILK REPLACER	.24	2,481.87		
SUPPLEMENT	43.51	373.12		
MOLASSES	.14	366.67		
SALT	.36	248.48		
MINERALS & VITAMINS	4.09	921.50		
SUBTOTAL ----------	**317.56**	**91,376.64**	**86.34**	**11,209.94**
ROUGHAGE				
ALFALFA HAY	89.48	161.59	86.62	117.94
ALFALFA PELLETS	1.90	176.69		
STRAW FED	5.39	96.50	2.03	54.20
GREENFEED	.00	.00	4.90	83.83
SILAGE/HAYLAGE (DRY EQ.)	138.82	112.53	285.01	106.68
SUBTOTAL ----------	**235.58**	**30,934.92**	**378.56**	**41,140.29**
GRINDING & PROCESSING		1,728.27		
GRAND TOTAL FEED COSTS ----------		**124,039.83**		**52,350.23**
BEDDING	81.78	62.59	50.03	53.47

AV. PRICE	CONCENTRATE	253.99 $/TONNE
	ROUGHAGE	117.36 $/TONNE
FED PER COW	CONCENTRATE	4.17 TONNES
	ROUGHAGE	6.34 TONNES
% HOME GROWN	CONCENTRATE	21.38 %
	ROUGHAGE	61.64 %

APPENDIX C

Southern Alberta

Average Dairy Farm Summary

2003

Southern Alberta
2003 Dairy Cost Study - Business Analysis
32 Participants
Table 1 Dairy Enterprise Costs and Returns

	TOTAL ENTERPRISE	PER COW	PER HL SOLD	PERCENT FROM INCOME
INCOME:				
MILK SALES	600,080.50	5,866.82	64.51	
MILK SUBSIDY	.00	.00	.00	
POOL ADJUSTMENTS (+ -)	(20,604.49)	(201.44)	(2.22)	
MISCELLANEOUS RECEIPTS	1,213.13	11.86	.13	
NET CATTLE SALES (+ -)	19,121.15	186.94	2.06	
NET INVENTORY CHANGE (+ -)	10,304.87	100.75	1.11	
GROSS INCOME	**610,115.16**	**5,964.92**	**65.59**	**100.00**
EXPENSES:				
GRAIN	15,400.62	150.57	1.66	
COMPLETE FEED	77,382.68	756.55	8.32	
SUPPLEMENT	37,467.04	366.30	4.03	
MINERALS & VITAMINS	1,183.78	11.57	.13	
ROUGHAGE	77,228.99	755.05	8.30	
PROCESSING COSTS	508.71	4.97	.05	
TOTAL FEED COSTS	**209,171.82**	**2,045.01**	**22.49**	**34.28**
BEDDING AND SUPPLIES	19,311.45	188.80	2.08	
BREEDING	7,421.30	72.56	.80	
VET. AND MEDICINE	13,782.41	134.75	1.48	
MILK HAULING	18,519.83	181.06	1.99	
PRODUCER'S FEES	14,162.88	138.47	1.52	
UTILITIES	14,912.30	145.79	1.60	
FUEL, OIL, LUBE	6,154.20	60.17	.66	
BLDG. & MACH. REPAIRS	16,470.94	161.03	1.77	
MISCELLANEOUS	25,365.44	247.99	2.73	
TOTAL OTHER VARIABLE COSTS	**136,100.75**	**1,330.62**	**14.63**	**22.31**
HIRED LABOUR	30,440.26	297.61	3.27	
FAMILY LABOUR	53,107.78	519.22	5.71	
TOTAL LABOUR COSTS	**83,548.04**	**816.83**	**8.98**	**13.69**
TOTAL VARIABLE COSTS	**428,820.61**	**4,192.46**	**46.10**	**70.29**
RENT	2,620.47	25.62	.28	
TAXES AND INSURANCE	9,764.44	95.46	1.05	
DEPRECIATION	58,695.87	573.85	6.31	
INTEREST (CAP DEBT)	25,979.31	253.99	2.79	
TOTAL CAPITAL COSTS	**97,060.09**	**948.93**	**10.43**	**15.91**
TOTAL PRODUCTION COSTS	**525,880.70**	**5,141.39**	**56.53**	**86.19**
CONTRIBUTION MARGIN ($)	181,294.55	1,772.46	19.49	
RETURN TO EQUITY ($)	84,234.46	823.54	9.06	13.81
MILK PRICE			62.30	
INVENTORY ADJUSTMENT			3.29	
RETURN TO EQUITY (%)			12.48	
AVERAGE CAP. DEBT INTEREST RATE (%)			5.73	

Southern Alberta
2003 Dairy Cost Study - Business Analysis
32 Participants
Table 2 Statement of Investment

LAND BUILDINGS & EQUIPMENT	AGE	DEPRECIATION	DAIRY INVESTMENT
DAIRY BUILDINGS	8.99	26,152.25	**632,846.72**
POWER MACHINERY	5.49	12,251.49	85,162.90
DAIRY EQUIPMENT	8.65	12,343.91	54,220.20
OTHER EQUIPMENT	7.56	7,948.22	36,349.40
TOTAL EQUIPMENT	**6.82**	**32,543.62**	**175,732.50**
LAND			47,581.80
SUPPLIES			12,491.49
** SUBTOTAL **		**58,695.87**	**868,652.50**

DAIRY LIVESTOCK	— BEGIN YEAR — NUMBER	VALUE	— END OF YEAR — NUMBER	VALUE	AVERAGE VALUE
COWS	101.59	171,247.20	106.53	179,569.88	175,408.54
BRED HEIFERS	34.00	47,600.00	34.97	48,956.25	48,278.13
OPEN HEIFERS	26.41	26,406.25	25.91	25,906.25	26,156.25
HEIFER CALVES	26.69	6,671.88	31.03	7,757.81	7,214.84
BULL CALVES	6.78	474.69	10.03	702.19	588.44
BULLS	1.28	1,921.88	1.16	1,734.38	1,828.13
** SUBTOTAL **	**196.75**	**254,321.88**	**209.63**	**264,626.76**	**259,474.32**

TOTAL DAIRY INVESTMENT	**1,128,126.82**
CAPITAL LOANS	453,303.73
OPERATOR EQUITY	674,823.09
INVESTMENT PER COW	11,029.37
DEBT/CAPITAL RATIO	.40
CAPITAL TURNOVER (YR)	1.85

HERD SIZE	Average	Median
NUMBER OF DAIRY COWS	102.28	87.04
NUMBER OF ANIMAL UNITS	157.71	136.46
DRY COWS (%)	17.66	
CALF CROP (%)	93.49	
PASTURE PER COW (AC)	2.2	

CATTLE SALES & PURCHASES	NUMBER	SELLING PRICE	NUMBER	PURCHASE PRICE
COWS	20.28	845.93	1.53	1,602.04
BRED HEIFERS	2.06	1,483.72	1.66	1,546.79
OPEN HEIFERS	.59	1,376.10	.16	2,820.00
HEIFER CALVES	.41	752.46	1.94	214.19
BULL CALVES	31.91	100.89	.00	.00
BULLS	.66	1,217.51	.25	1,462.50
TOTAL VALUE		**25,357.40**		**6,236.25**

Southern Alberta
2003 Dairy Cost Study - Business Analysis
32 Participants
Table 3 Labour and Management

LABOUR

	HOURS	VALUE	HOURLY RATE
OPERATOR LABOUR	2,442.74	36,641.11	15.00
HIRED LABOUR	2,124.62	30,440.26	14.33
FAMILY UNPAID LABOUR	1,151.00	16,466.67	14.31
TOTAL	**5,718.35**	**83,548.04**	**14.61**

RETURN TO FAMILY LABOUR	17.56
MAN EQUIVALENTS	2.29
LABOUR HOURS PER COW	55.91
YEARS FARMING	20.05

MILK PRODUCTION

	HL.	% OF TOTAL	VALUE	PRICE
CLASS I MILK	4,574.91	47.56	328,566.82	71.82
INDUSTRIAL MILK	4,526.02	47.05	269,718.62	59.59
4M MILK	189.65	1.97	1,795.06	9.47
CONTRACTED EXPORT MILK	.00	.00	.00	.00
SUB-TOTAL	9,290.58	96.58	600,080.50	64.59
OTHER MILK SALES	11.41	.12	.00	.00
FED TO LIVESTOCK	317.48	3.30	20,618.84	64.95
TOTAL	**9,619.46**	**100.00**	**620,699.33**	**64.53**

FLUID QUOTA	1,442.50 LITRES/DAY
MSQ QUOTA	15,879.63 KG/YR
FLUID QUOTA PRICE	903.36 $/LITRE
FLUID QUOTA LEASED PRICE	28 $/LITRE
MSQ QUOTA PRICE	57.08 $/KG
MSQ QUOTA LEASED PRICE	7.57 $/KG
CLASS 1 UTILIZATION	84.88 %

		COMPONENT PRICES ($/KG)		
		CLASS I	EXCESS	WORLD
BUTTERFAT TEST	3.64 KG/HL	4.98	6.36	.85
PROTEIN	3.24 KG/HL		7.64	.78
L O S	5.60 KG/HL		1.87	.79

MILK PRODUCTION PER COW 9,404.67 LITRES / YEAR

MANAGEMENT FACTORS

COST PER HL	56.53
CEM COST PER HL	33.60
MILK/FEED (KG) RATIO	2.17 LITRES
MILK/LABOUR (HR) RATIO	168.22 LITRES
MILK/CAPITAL ($) RATIO	.85 LITRES

Southern Alberta
2003 Dairy Cost Study - Business Analysis
32 Participants
Table 4 Feed Report

	--- PURCHASED ---		--- HOMEGROWN---	
CONCENTRATES	**QUANTITY (TONNES)**	**PRICE**	**QUANTITY (TONNES)**	**PRICE**
OATS	00	.00	65	166.50
BARLEY	42.97	143.24	30.43	149.66
WHEAT	00	00	00	00
MIXED GRAIN	00	00	00	00
BREW GRAIN (DRY EQ.)	1.30	166.16		
BEET PULP	01	338.74		
OTHER PURCHASED	31.75	137.41		
DAIRY RATION	221.33	322.75		
CALF FEED	17.63	314.92		
MILK REPLACER	.17	2,257.85		
SUPPLEMENT	93.31	400.13		
MOLASSES	43	306.59		
SALT	.37	301.75		
MINERALS & VITAMINS	3.88	276.10		
SUBTOTAL ----------	**413.16**	**126,770.58**	**31.09**	**4,663.54**
ROUGHAGE				
ALFALFA HAY	67.28	133.26	132.84	126.09
ALFALFA PELLETS	00	00		
STRAW FED	7.60	52.95	5.84	53.41
GREENFEED	60	135.40	5.17	88.19
SILAGE/HAYLAGE (DRY EQ.)	88.05	93.79	368.01	114.14
SUBTOTAL ----------	**163.54**	**17,708.19**	**511.86**	**59,520.80**
GRINDING & PROCESSING		508.71		
GRAND TOTAL FEED COSTS ----------		**144,987.48**		**64,184.35**
BEDDING	105.77	49.35	65.76	53.32

AV. PRICE	CONCENTRATE	295.86 $/TONNE
	ROUGHAGE	114.35 $/TONNE
FED PER COW	CONCENTRATE	4.34 TONNES
	ROUGHAGE	6.60 TONNES
% HOME GROWN	CONCENTRATE	7.00 %
	ROUGHAGE	75.79 %

APPENDIX D

Charts Showing Individual Results

for Dairy Cost Study Participants

2003

Dairy Cost Study 2003

Individual Results

FIGURE 1. HERD SIZE

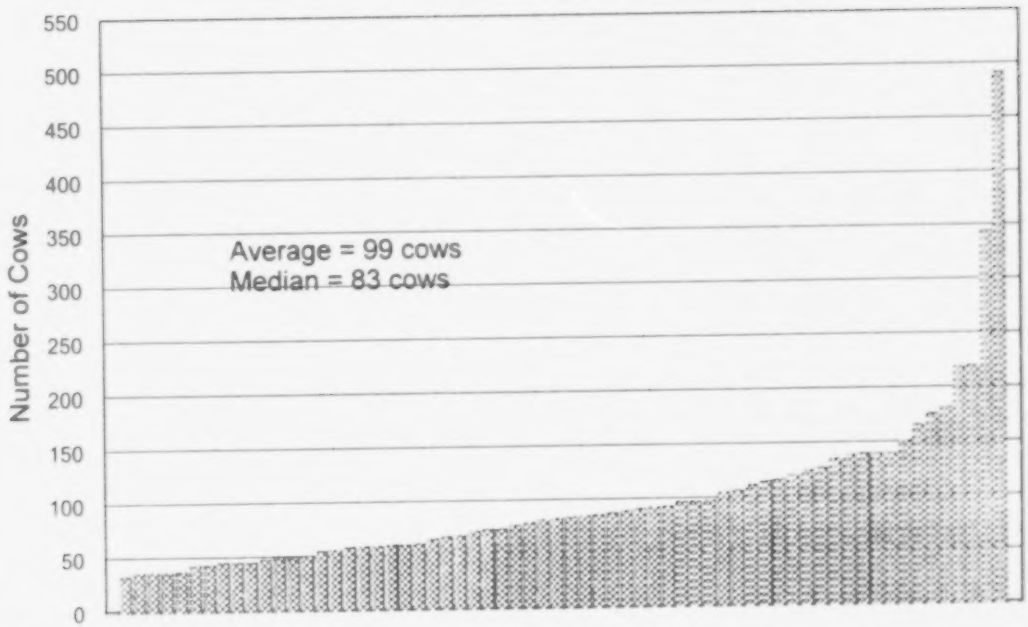


FIGURE 2. MILK PRODUCTION
(Litres/Cow)

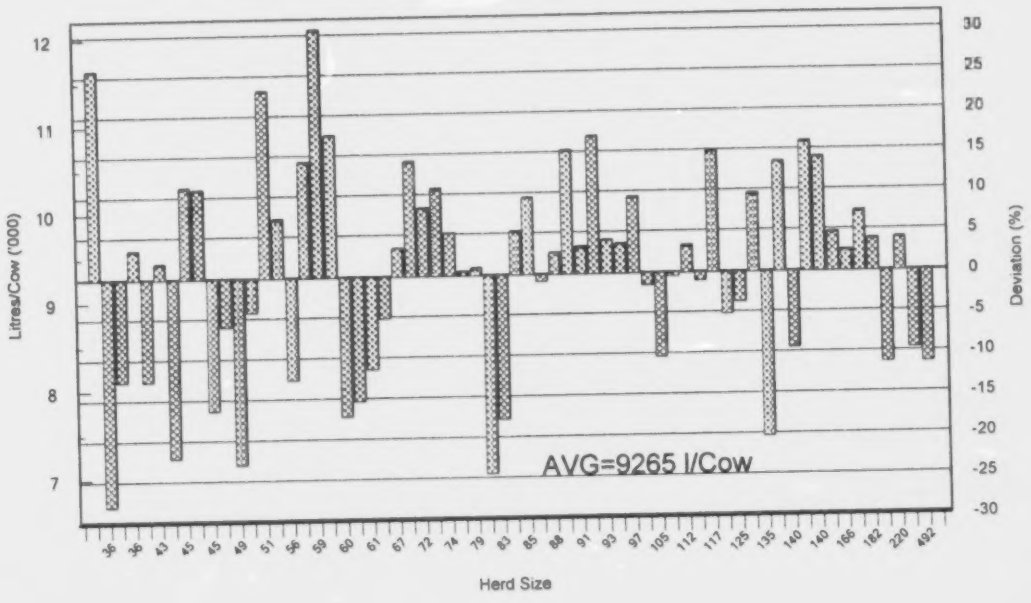


FIGURE 3. COST OF PRODUCTION
(Dollars/hl)

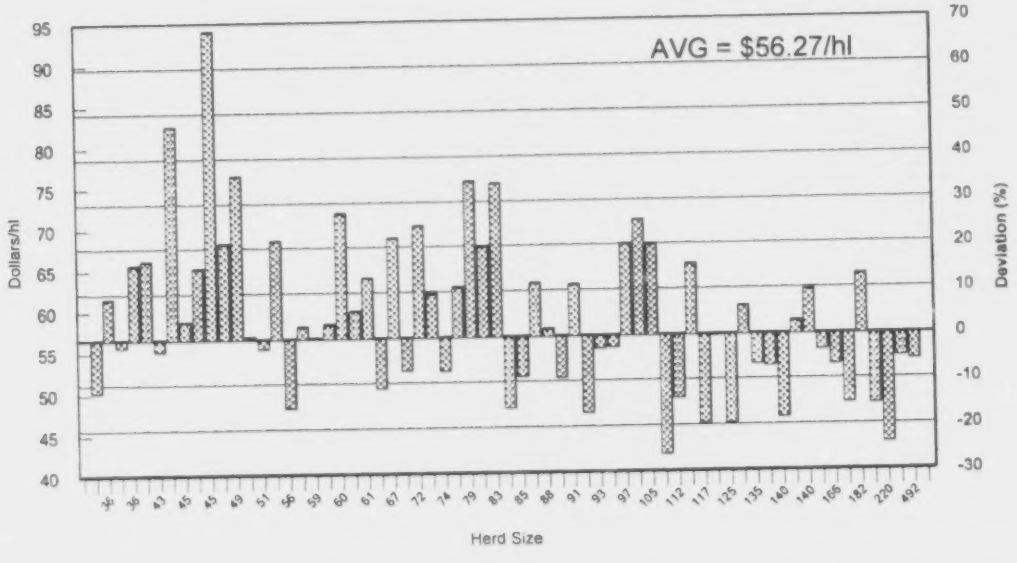


FIGURE 4. CONCENTRATE USE
(Tonnes/Cow)

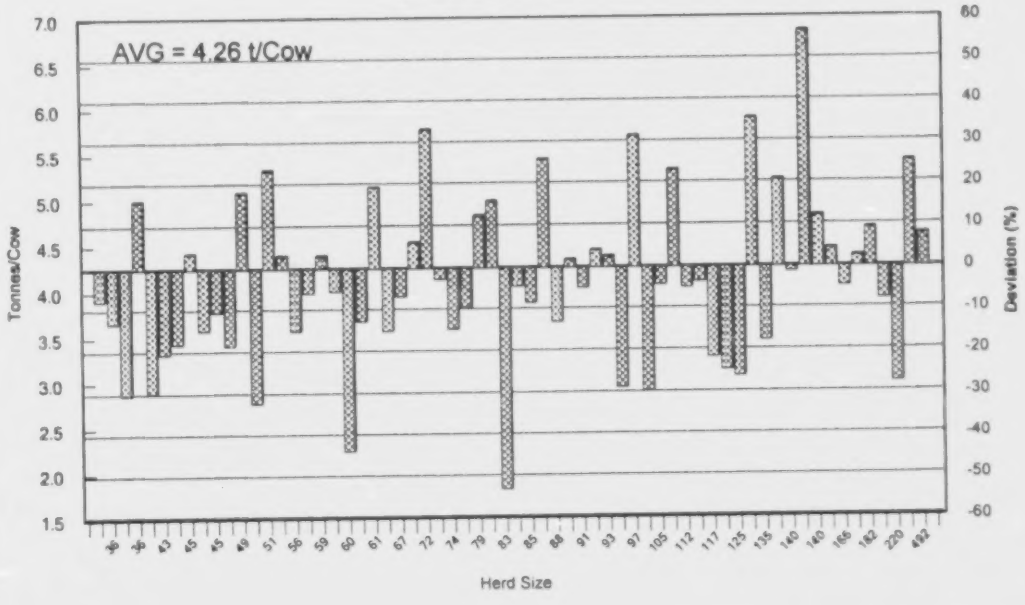


FIGURE 5. ROUGHAGE USE
(Tonnes/Cow)

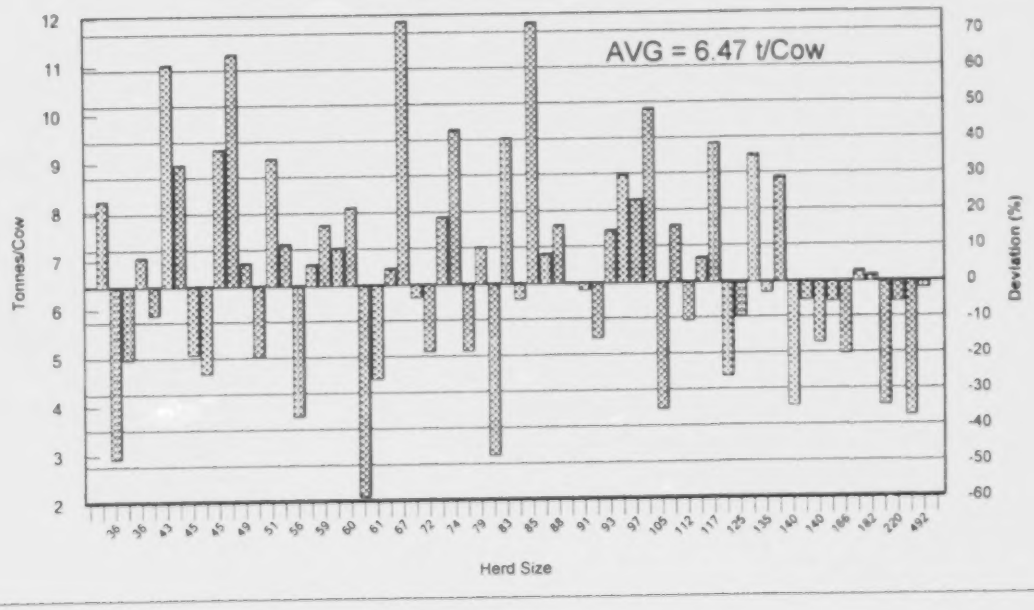


FIGURE 6. LABOUR USE
(Hours/Cow)

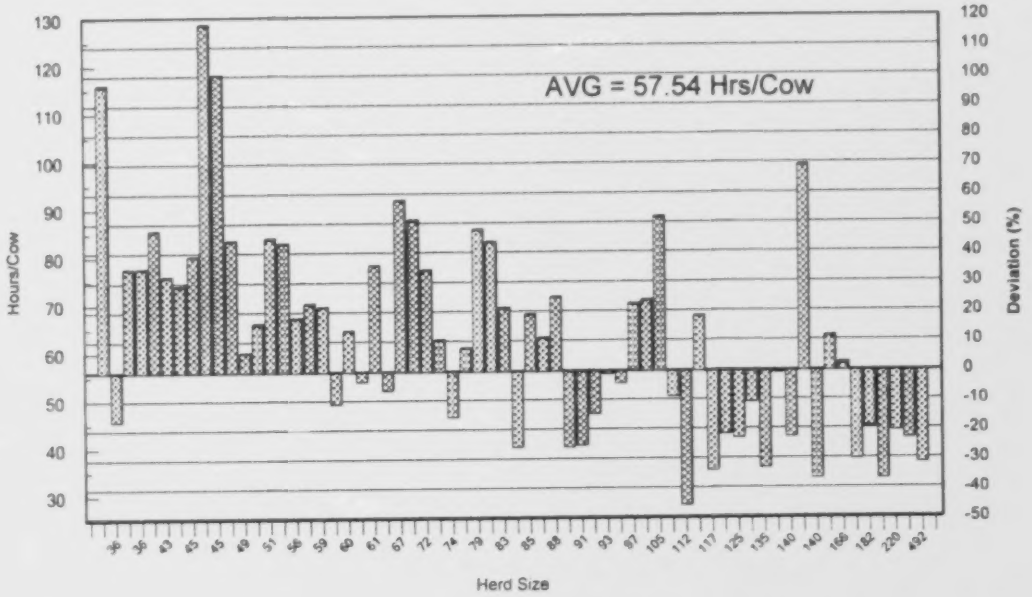


FIGURE 7. INVESTMENT
(Dollars/Cow)

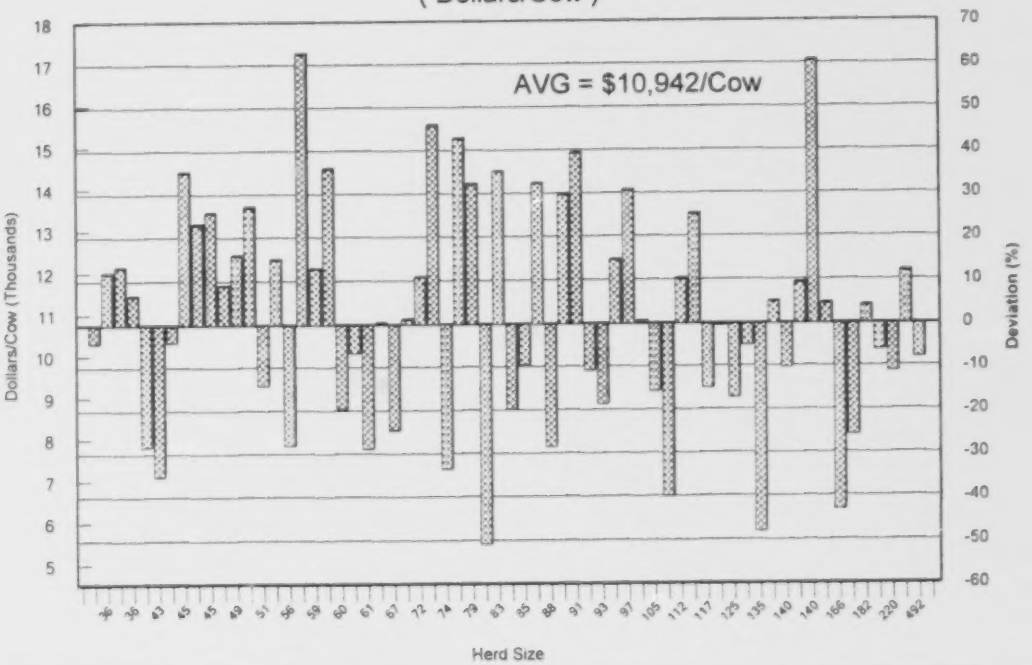


FIGURE 8: TOTAL FEED COST
(Dollars/Cow)

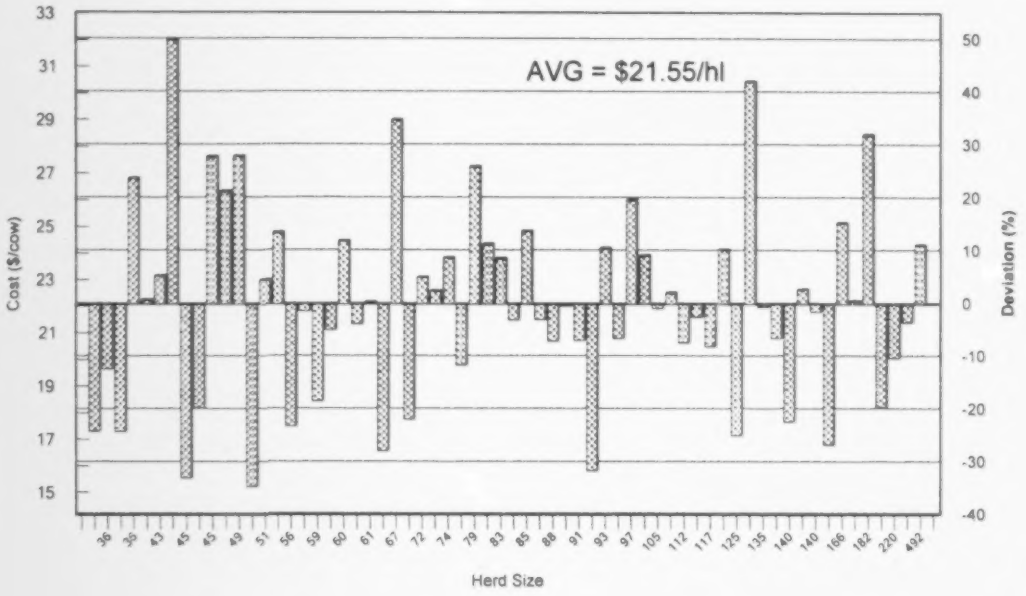
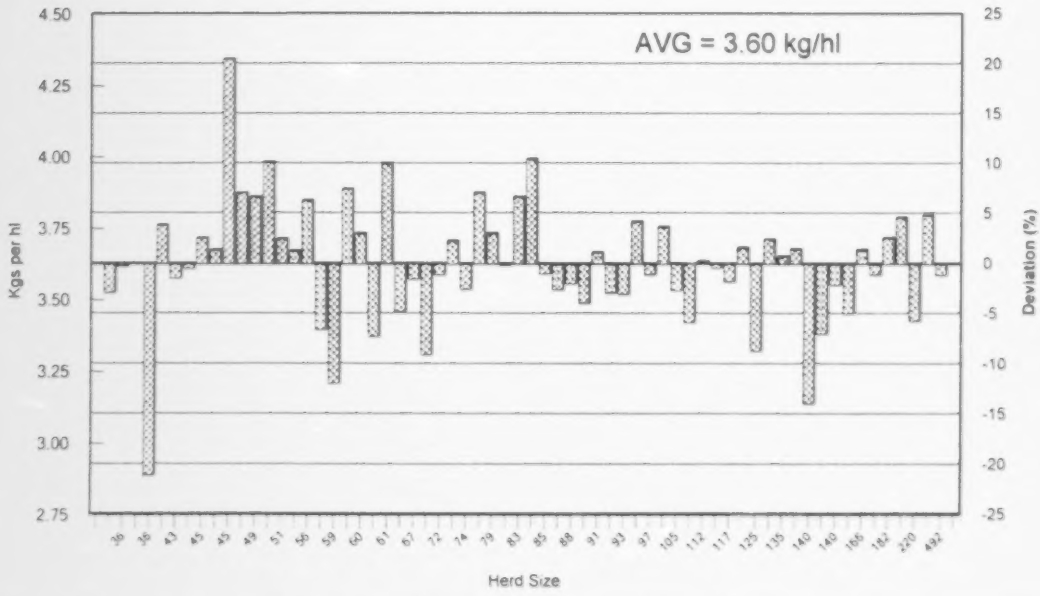


FIGURE 9. BUTTERFAT TEST
(Kgs per hl)



APPENDIX E

Monthly / Annual Questionnaires

2003

DAIRY COST SURVEY, 2003

Monthly Reporting Sheet

Confidential

Name: _____

Month: _____

If you have any questions, please call Pauline Van Biert at (780) 415-2153, toll free by first dialing 310-0000

Code	DAIRY HERD	Beginning No	Purchases No.	Purchases Value	No. Born	Died or Trans/Out	Sales No.	Sales Value	End No.
1	Milking Cows								
2	Dry Cows								
3	Bred Heifers								
4	Open Heifers								
5	Heifer Calves								
6	Bull Calves								
7	Herd Bulls								

Code	CAPITAL PURCHASES	Specify		Total Value ($)	% to Dairy	% to Crops	% to Other Livestock
1	Equipment	*Purchases:*					
2		*Sales:*					
3	Tractor/Truck	*Purchases:*					
4		*Sales:*					
5	Buildings	*Purchases/Const.:*					
6		*Sales:*					
7	Fluid Quota	*Purchased:*	(litres)				
8		*Sold:*	(litres)				
		Leased:	(litres)				
9	MSQ Quota	*Purchased:*	(kg)				
10		*Sold:*	(kg)				
		Leased	(kg)				

Code	SALES*	Litres	Value
2	Milk Fed To Livestock		
3	Milk Home Use		
4	Unuseable Milk		
5	Miscellaneous Dairy Income - Specify:		
34	Contract Export Milk		

*** All Plant Sales will be recorded from Milk Statement**

Code	FEED Used by Dairy Herd	Office Use	Unit Type*	Amount Used	Price (if purchased)	Code		Office Use	Unit Type *	Amount Used	Price per Unit
1	Barley					21	Dairy Ration				
2	Oats					22	Supplement				
3	Wheat					23	Brew Grain				
5	Hay: H.G.					24	Beet Pulp				
6	Hay: Purch.					25	Alfalfa Pellets				
7	Silage					26	Calf Feed				
8	Haylage					27	Milk Replacer				
9	Greenfeed					28	Salt				
10	Straw - Fed					29	Min. & Vit.				
11	Straw-Bedding										
11	Sawdust										
12	Other					31	Grinding & Processing				

* T = Ton, t = tonne, bu = bushels, kg = kilograms,
ba = bales (please provide weight/bale)

Code	LABOUR to Dairy *		Total Hours	
1	Operator			
2	Wife, Partner			
3	Family Labour	*Over 16*		
4		*Under 16*		Wages & Board
5	Hired Labour	*1.*		
5		*2*		
5		*3*		

* do not include hours spent doing field work

Code	EXPENSES	Total Farm ($)	% to Dairy	% to Crops	% to Other Livestock
1	Veterinary and Medicine				
1	Breeding				
2	Livestock & Barn Supplies				
3	Building & Fence Repair				
4	Machinery & Equipment Repair				
5	Fuel, Oil, Lube (for equipment, not heating)				
13	Natural Gas (Gj =)				
14	Electricity (kWh =)				
15	Other Utilities (phone, propane, heating oil, etc.)				
7	Insurance, Licences & Taxes				
8	Cash Rental (pasture, equipment, leases, etc.)				
9	Operating Loan Interest				
10	Custom Manure Hauling & Cleaning				
11	Silage Bags (hay tarps, plastic, etc.)				
12	Misc. (legal, acct, D.H.I., etc)				
12					

DAIRY COST SURVEY, 2003

Investments and Liabilities

Confidential

General Information

Name:	Fluid Milk Quota (Jan. 1)	Litres:	
E-Mail:	MSQ Milk Quota (Jan. 1)	kg:	
Fax:	Number of Years in Dairy		

Land Information

	Acres:	$/Acres:	% to Dairy	% to Other Enterprises
Building Site				
Crops				
Forages				
Pasture				
Other				

Other Enterprises (check)

____ Backgrounding

____ Poultry

____ Other (specify) _____

	FARM LOANS	Owing: Jan. 1, 2003	Interest Rate	% to Dairy	% to Crops	% to Other Livestock
1	Land:					
1						
2	Building:					
2						
3	Livestock:					
3						
4	Machinery:					
4						
5	Other:					

	SUPPLIES	Value: Jan. 1, 2003	% to Dairy	% to Crops	% to Other Livestock
1	Gas, Oil & Grease				
2	Vet., Semen, Etc				
3	Bedding				
4	Dairy Livestock Supplies				
5	Rations & Supplements				
6	Other Supplies				

If you have any questions, please call Pauline Van Biert at (780) 415-2153, toll free by first dialing 310-0000

DAIRY COST SURVEY, 2003

Confidential

Machinery and Buildings as at Jan.1, 2003

Name: _____

	Buildings Used for Dairy:	Purchased Price	Year Purchased	% to Dairy	% to Crops	% to Other Livestock
1						
1						
1						
1						
1						
1						
1						
1						
1						

Examples: barns, machine shed, hay sheds, bunkers, shop, calf hutches, corrals

Tractors & Trucks Used for Dairy:

2						
2						
2						
2						
2						
2						
2						
2						

Dairy Equipment:

3						
3						
3						
3						
3						
3						
3						
3						
3						
3						

Examples: bulk tank, pipeline, milk meters, washer, vacuum pump, generator, buckets

SEE OVER

Other Equipment Used for Dairy:		Purchased Price	Year Purchased	% to Dairy	% to Crops	% to Other Livestock
4						
4						
4						
4						
4						
4						
4						
4						
4						
4						
4						
4						
4						
4						
4						

Examples: manure spreader, barn cleaner, manure pump, cattle trailer, quad, bale feeders, silo unloader, scraper, feed mixers, sawdust blowers, semen tank, fencers, fans, crowd gate, small tools (table saw, drill press, welder, power tools), fuel tanks, wheel barrows, computer feeding system, home computer

APPENDIX F

Alberta Fluid Milk Price Formula

2003

Alberta Fluid Milk Price Formula

Formula Pricing

Milk sold for household consumption in Alberta (Class 1a) is priced at the producer level by the Alberta Energy and Utilities Board (AEUB). Prior to 1994, the Alberta Public Utilities Board established prices at the producer, wholesale, and retail levels.

The price of fluid milk is established through a procedure known as "formula pricing", whereby an equitable price for Class 1a milk is determined through the use of selected statistical indices. In the 2003 Alberta milk pricing formula, these indicators include eight dairy production cost factors as well as one consumer demand factor. The result is an "economic formula" which incorporates supply and demand components.

Formula Development in Alberta

In 1973, the Production Economics Branch of Alberta Agriculture designed a milk pricing formula which was compared with actual milk price levels over the previous ten years. It was adopted for experimentation over a 12 month period from August, 1973 to August, 1974. Upon presentation and discussion of the results at a hearing in Red Deer in August, 1974, the Alberta Public Utilities Board ordered the formula to be used as a pricing mechanism for a test period of one year starting in October. This was to be accompanied with a cost of production program to monitor its suitability and to assess adjustments in the formula components, if required, at the end of the period.

The Alberta Fluid Milk Formula

The original Alberta fluid milk formula consisted of seven statistical factors or components (Table 1). The first five represented producers' major cost components, and therefore are a reflection of willingness to sell. The last two represent consumer demand.

Table 1

COMPONENTS OF THE ALBERTA FLUID MILK PRICING FORMULA

Old Formula		New Formula	
Index	Weight	Index	Weight
Alberta Dairy Feed Prices	14	Alberta Dairy Feed Prices	21
Alberta Hay Prices	14	Alberta Hay Prices	14
Western Cdn Farm Wage Index	12	Alberta Farm Wages	16
W. Cdn Farm Input Price Index	20	Fuel and Utilities Price Index	4
Canadian Consumer Price Index	10	Equipment Price Index	3
Alberta Industrial Wage Index	16	Building Construction Index	6
Alberta Milk Consumption	14	Bank of Canada Rate	4
		Gross Domestic Product Index	22
		W. Canada Milk Consumption	10
Total	100	Total	100

The fluid milk formula was revised on July 2, 2002. The revisions were needed because two key indices in the old formula were discontinued by Statistics Canada:

a) Western Canadian Farm Wage Index
b) Western Canadian Farm Input Price Index

The new formula has nine indices. In addition to the main supply factors of dairy feed, hay and wages, the new formula has indices representing other specific production costs (fuel and utilities, capital costs), as well as a general inflation index (gross domestic product index). The index representing demand is Western Canada per capita milk consumption.

Application

A base price of $21.04 per hectolitre for Class 1 milk was established in August, 1973. Determined from the results of the 1973 Dairy Cost Study, this provided for a return of 15 percent on sales income. The milk price formula combines the individual price indices listed in

Table 1 into a "composite" index. The composite index is essentially a weighted average of the individual price indices. This composite index was set at 100 for the base period, August 1973. With the revised formula, the new base period, also set at 100, is July, 2002. For each subsequent month, the formula then tracks the relative change of each individual price index, and the resulting change in the composite index. Next, the composite index is multiplied by the base price of $70.90, arriving at the "computed" formula milk price for the month in question.

Whenever the "computed" formula price differs by at least $0.49 per hectolitre above or below the existing Class 1 AEUB minimun producer price, the milk price formula adjusts the "suggested" milk price by $0.98 per hectolitre. This represents about a one cent per litre change in retail prices for the consumer. The Alberta Energy and Utilities Board bases its decision on setting the minimum price received by milk producers to a large extent on the milk price formula's "suggested" price.

Changes in the formula price are calculated monthly by the Economics Unit of AAFRD and are forwarded to the Alberta Energy and Utilities Board. The Alberta fluid milk formula calculations for 2003 are presented in Table 2.

TABLE 2
ALBERTA FLUID MILK PRICE FORMULA CALCULATIONS

MONTH	ALTA DAIRY FEED $/tonne	ALTA HAY PRICE $/tonne	ALTA FARM WAGE $/month	FUEL & UTILITIES price index	MACHINE & EQUIPMENT price index	BUILDING CONSTR'N price index	INTEREST RATE %	GDP inflation index	W. CANADA MILK CONSUM. l/month	PRICE FORMULA COMPOSITE INDEX	PRICE FORMULA COMPUTED PRICE $/hl	PRICE FORMULA SUGGESTED PRICE $/hl	PRICE SET BY A.E.U.B. $/hl
Weight	21	14	16	4	3	6	4	22	10	100			
Base Month July-02	257.14	142.80	1977.36	1.53	99.5	114.7	4.65	105.6	7.82	100.00	70.90	71.07	70.67
January 2003	289.13	160.24	1976.10	1.68	98.7	116.3	4.59	108.0	7.47	104.76	74.27	74.01	73.03
February	287.93	163.20	1972.82	1.65	98.7	116.3	4.56	108.0	7.86	105.32	74.67	74.99	74.01
March	282.01	159.52	1978.67	1.81	99.2	116.7	4.54	109.1	7.84	105.16	74.56	74.99	74.01
April	283.23	156.25	1977.71	1.93	99.2	116.7	4.51	109.1	7.84	105.22	74.60	74.99	74.99
May	280.12	152.26	1976.60	2.13	99.2	116.7	4.48	109.1	7.74	104.94	74.40	74.01	74.99
June	269.81	147.16	1942.36	2.12	96.8	118.5	4.45	111.1	7.74	103.71	73.53	74.01	74.99
July	269.12	121.75	1997.48	1.97	96.8	118.5	4.43	111.1	7.74	101.18	71.74	72.05	74.01
August	257.69	98.89	1967.71	1.96	96.8	118.5	4.40	111.1	7.52	97.45	69.10	69.11	74.01
September	243.87	80.84	2010.09	1.88	93.7	119.5	4.37	110.7	7.52	94.53	67.02	67.15	72.05
October	239.76	86.75	1992.04	1.89	93.7	119.5	4.34	110.7	7.52	94.62	67.08	67.15	69.11
November	240.26	92.67	2007.26	1.87	93.7	119.5	4.29	110.7	7.46	95.21	67.50	67.15	67.15
December	241.82	92.67	2002.91	1.77	92.8	119.7	4.25	111.5	7.46	95.15	67.46	67.15	67.15